

# DuraStor 6200SR Operator Control Panel

## **User's Guide**

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## **1 Introduction**

- Accessing the OCP 1-1
- Navigating the OCP Menu System 1-1

## **2 Creating and Managing Arrays and Partitions**

- Creating Arrays 2-1
  - Creating a Single-Partition Array 2-2
  - Creating a Multiple-Partition Array 2-6
- Managing Arrays 2-9
  - Adding a Partition 2-9
  - Viewing Array and Disk Drive Information 2-10
  - Stopping the Array Initialization Process 2-12
  - Verifying an Array 2-13
  - Reconstructing an Array 2-15
  - Expanding Array Capacity 2-15
  - Changing an Array Name 2-17
  - Changing Array Ownership 2-18
  - Trusting an Array 2-18
  - Deleting an Array 2-20
- Managing Partitions 2-21
  - Viewing Partition Status Information 2-21
  - Expanding a Partition 2-24
  - Changing a Partition Name 2-24
  - Changing a Partition LUN 2-25
  - Deleting a Partition 2-25
- Setting Host LUN IDs 2-26

## **3 Monitoring System Status**

- Using the Event Log 3-1
  - Viewing the Event Log 3-2
- Using the Hardware Menu 3-2
  - Accessing the Hardware Menu 3-2
  - Viewing the Activity Screen 3-2
  - Viewing the Power Screen 3-3

- Viewing the Fans Screen 3-3
- Viewing the Mode Screen 3-4
- Using the Utilities Menu 3-4
  - Displaying Hardware Information 3-4
  - Displaying Overall Statistics 3-4
  - Resetting Overall Statistics 3-6

## **4 Managing Spares**

- Managing Dedicated Spares 4-1
  - Adding a Dedicated Spare 4-2
  - Deleting a Dedicated Spare 4-3
- Enabling Dynamic Spares 4-3
- Managing the Spare Pool 4-4
  - Adding a Spare to the Spare Pool 4-4
  - Deleting a Spare from the Spare Pool 4-5
  - Displaying the Spare Pool 4-5

## **5 Configuring the RAID Controller**

- Rebooting the Controller 5-2
- Changing the Date and Time 5-2
- Configuring the Host Channels 5-3
- Configuring the SCSI Channels 5-5
- Working with the Operating Modes 5-6
  - Changing the Operating Mode 5-8
- Managing the Other Controller 5-8
  - Displaying Information about the Other Controller 5-8
  - Shutting Down the Other Controller 5-9
  - Shutting Down Both Controllers 5-9
  - Killing the Other Controller 5-10
  - Unkilling the Other Controller 5-10
- Understanding the Audible Alarm 5-11
  - Changing the Alarm Mute Setting 5-11
- Locking the Cache 5-13
- Enabling and Disabling the Battery 5-13
- Changing the Utility Priority 5-14
- Rescanning All Channels 5-14
- Pausing I/O 5-15
- Restoring Default Settings 5-16

## 6 Managing Disk Drives and Enclosures

- Managing Disk Drives 6-1
  - Displaying Disk Drive Information 6-2
  - Clearing Metadata from a Disk Drive 6-3
  - Enabling and Disabling Write-back Cache 6-3
  - Displaying Disk Cache Status 6-4
  - Enabling and Disabling SMART Changes 6-5
  - Blinking a Disk Drive LED 6-5
  - Taking Down a Disk Drive 6-6
  - Testing a Disk Drive 6-7
- Managing SAF-TE Enclosures 6-7
  - Changing the SEP LUN 6-7
  - Changing the Additional SEP Settings 6-8

## 7 Troubleshooting

- Adaptec Technical Support 7-1
- Array Problems 7-1
- Host SCSI Channel Problems 7-3
- Device SCSI Channel Problems 7-3
- Problems During Bootup 7-4
- Warning and Error Events 7-6
  - Warnings 7-6
  - Errors 7-8
- Using the Loader Diagnostics Menu 7-8
- Using the Loader Utility Menu 7-8
- Understanding SCSI Errors 7-9
  - Disk Errors 7-9
  - Disk Channel Errors 7-11
  - Voltage and Temperature Errors and Warnings 7-12

## Index

# Introduction

You can control and manage the complete DuraStor Storage Subsystem without disk array management application or a computer monitor by using the Operator Control Panel (OCP) on the front bezel of the DuraStor 6200SR RAID appliance.

## Accessing the OCP

- 1 Set the switch on the I/O connectivity panel on the back of the DuraStor 6200SR to **Int**.

This sets the input mode to internal and activates the OCP.

- 2 On the OCP, press **Enter**.
- 3 Select **Hardware Menu**, then press **Enter**.
- 4 Select **Mode**, then press **Enter**.
- 5 Select **Serial Port:OCP Mode**, then press **Enter**.

Refer to *I/O Connectivity Panel* of the *DuraStor Installation and User's Guide* for more information.

## Navigating the OCP Menu System

Figure 1-1 shows the OCP. Menu options appear in the two-line LCD window. You navigate the menus using the OCP buttons. Table 1-1 describes the primary navigation and selection methods.

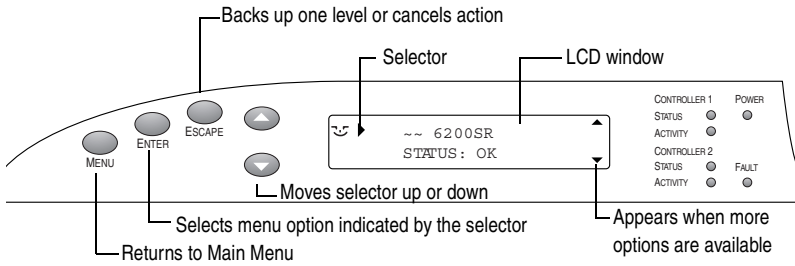


Figure 1-1. The Operator Control Panel

Table 1-1. OCP Menu Navigation

| To                                                        | Do this                    |
|-----------------------------------------------------------|----------------------------|
| Open the Main Menu.                                       | Press <b>Menu</b> .        |
| Select a menu option.                                     | Press <b>Enter</b> .       |
| Cancel a selection or go back one menu level.             | Press <b>Esc</b> .         |
| Scroll through the available choices, or move the cursor. | Press <b>↑</b> or <b>↓</b> |



**Note:** After 4 minutes of inactivity, the OCP times out and returns to the Controller Status display.

Figure 1-2, Figure 1-3, and Figure 1-4 provide an overview of the OCP menus.

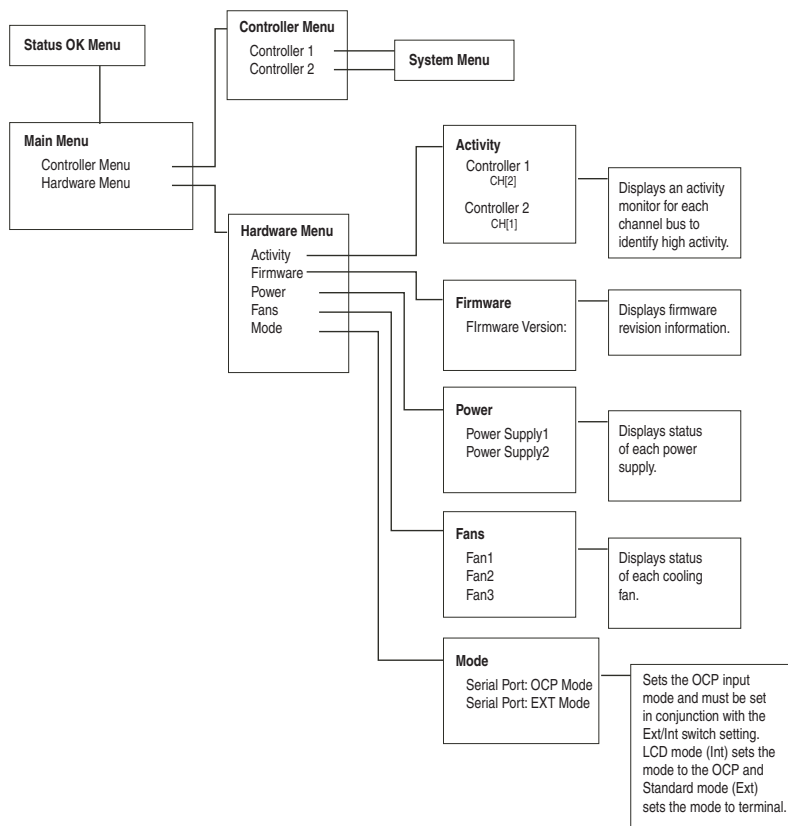


Figure 1-2. Menu Tree Part 1

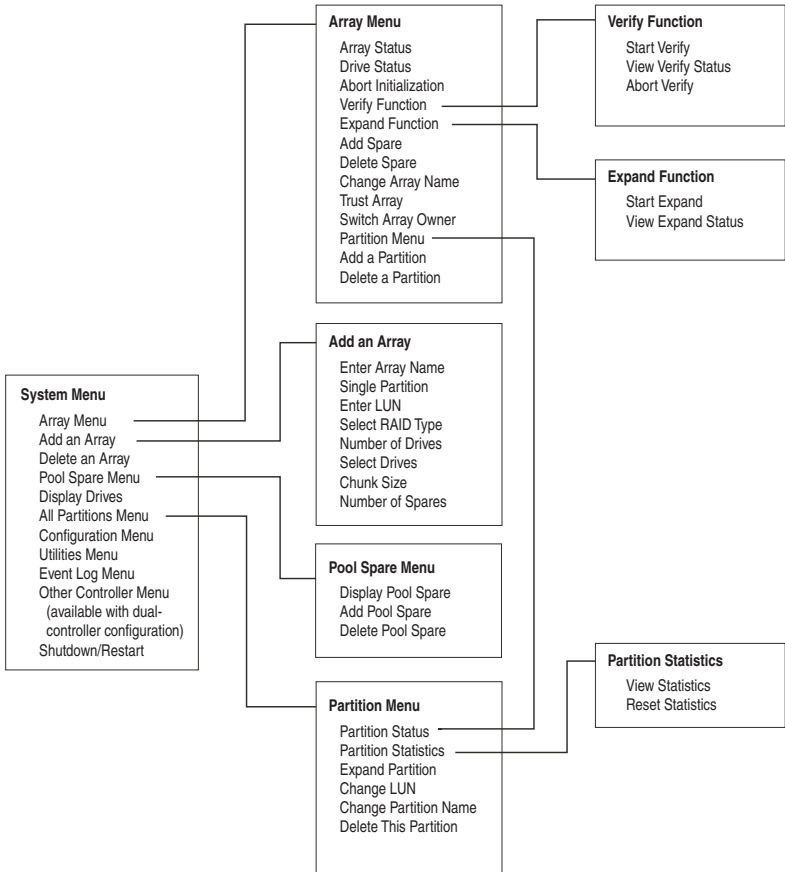


Figure 1-3. Menu Tree Part 2

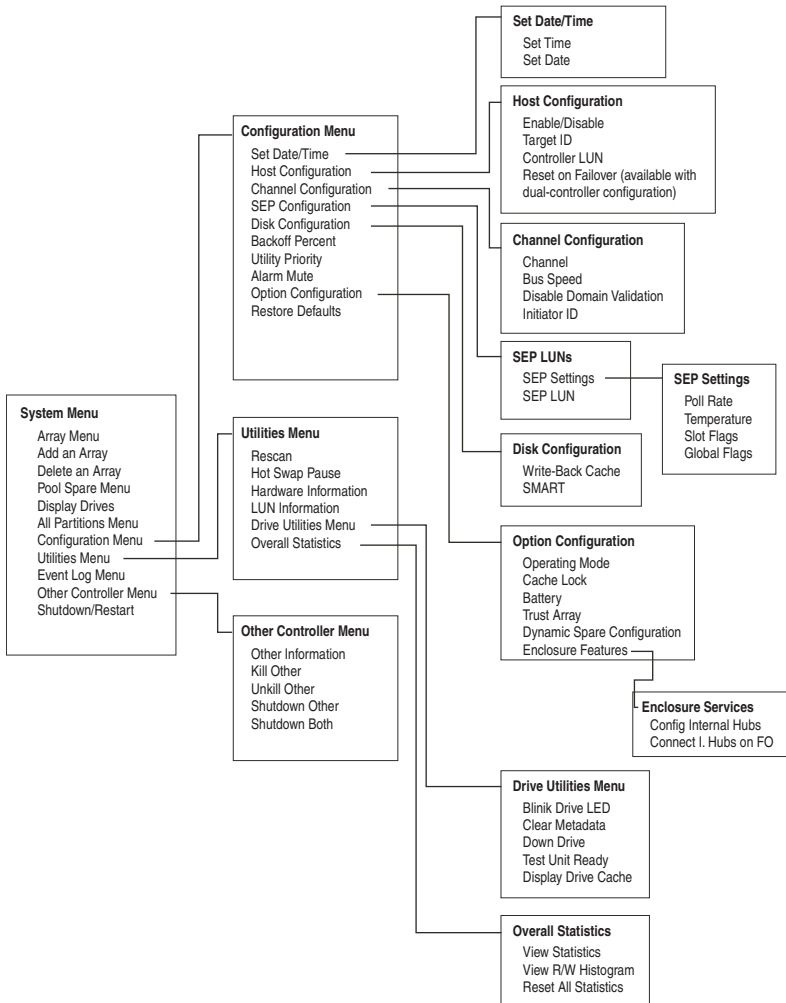


Figure 1-4. Menu Tree Part 3

# Creating and Managing Arrays and Partitions

Using the OCP, you can perform the following array-related functions:

- Create arrays (see [page 2-1](#)).
- Manage arrays (see [page 2-9](#)).
- Manage partitions (see [page 2-21](#)).

## Creating Arrays

You can create an array at any time. [Table 2-1](#) describes the disk drive requirements for each RAID level.

Table 2-1. Disk Drive Requirements by RAID Level

| RAID Level | Minimum Number of Disk Drives | Maximum Number of Disk Drives |
|------------|-------------------------------|-------------------------------|
| Volume Set | 1                             | 1                             |
| 0          | 2                             | 16                            |
| 3          | 3                             | 16                            |
| 4          | 3                             | 16                            |
| 5          | 3                             | 16                            |
| 50         | 6                             | 24                            |
| Mirrored   | 2                             | 16                            |



---

**Note:** Before you create more than one array, you must be sure that your host's operating system (OS) supports multiple Logical Unit Numbers (LUNs). Most operating systems (OSs) support multiple LUNs, or can be enabled to. If yours does not, the host sees only one array at LUN 0. Refer to *Setting the Host System HBA to Multiple-LUN* in the *DuraStor Installation and User's Guide*.

---

Before you create an array, decide whether you want to partition the array. You can create two types of arrays:

- **Single-partition array**—an array that stores all data in a single partition and is accessed by a single LUN. See [Creating a Single-Partition Array on page 2-2](#).
- **Multiple-partition array**—an array that can have one or more partitions, with each partition assigned its own LUN. See [Creating a Multiple-Partition Array on page 2-6](#).



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**Warning:** We strongly recommend that you regularly and consistently back up your data so that it may be recovered in the event of a failure that's not protected by a fault-tolerant array.

---

## Creating a Single-Partition Array

You can create an array that has just one partition. Once you create a single-partition array, you can add more partitions later. Single-partition arrays work well in environments that need one large, fault-tolerant storage space for data on one server. An example would be a large database on a single server that is used only for that application.

- 1 Press **Menu**, choose **Controller Menu**, then press **Enter**.
- 2 Choose the desired controller, then press **Enter**.
- 3 Choose **Array Menu**, then press **Enter**.
- 4 Choose **Add an Array**, then press **Enter**.

## 5 Enter a name for the array.

You can enter up to 27 characters (A-Z and 0-9), one at a time. Use ↑ and ↓ to choose a character and then press **Enter**. Repeat until the name is complete, then press **Enter**.



**Note:** If you do not want to name the array, skip this step by pressing **Enter**. You can add or change the name later. The array will be given the name A1 as a default to identify it. The names will increment by one value for each new unnamed array (A2, A3...).

The system asks if you want to create one partition now for the entire array.



**Note:** If you want to create a multiple-partition array, see [Creating a Multiple-Partition Array on page 2-6](#).

## 6 Choose **Y** to create a single-partition array, then press **Enter**.

## 7 Choose the LUN for the array, then press **Enter**. (Choose any number from 0-63.)

The system warns you about the LUN for Unix and Macintosh OSs. (See the *Note* on [page 2-2](#) for detailed information.) Press **Enter** and the system asks if you want to be warned again. Select **No** to avoid receiving this warning again, otherwise select **Yes** to be warned the next time you create a partition.

## 8 Choose the RAID level, then press **Enter**. (You can choose from RAID 0, RAID 3, RAID 4, RAID 5, RAID 50, VOLUME, or MIRRORED.)



**Note:** A RAID 10 array is automatically created when there are more than two disk drives in a mirrored array.

- If you selected RAID 50 as the array type, the Pick RAID 50 Array Size screen appears.

Choose the configuration you want, then press **Enter**.

- If you chose any array type other than RAID 50, the Number of Drives screen appears.

- 9** Choose the number of disk drives in the array, excluding spares, then press **Enter**.

The Select Drives screen appears.

If you are using active-active mode, the Select Drives menu includes all available disk drives (those that are not members of an array and are not assigned as dedicated or pool spares) on both controllers. It displays the following information for each disk drive:

- Channel number
- SCSI ID number
- Disk drive capacity
- Disk drive manufacturer
- Disk drive model number
- Disk drive firmware revision

- 10** Choose a disk drive to use in the array, then press **Enter**. Repeat until all the disk drives you want are selected.

- 11** After all the disk drives are selected, press **Enter**.

If the array is mirrored, RAID 3, RAID 4, RAID 5, or RAID 50 *and* you have one or more disk drives left, the Number of Spares screen appears.

If you are creating a different type of array, skip to [Step 15](#).

- 12** Choose the number of spares you want to add, then press **Enter**.

This creates dedicated spares that can only be used by this array. A dedicated spare disk drive is not available for any other use. For more information, see [Chapter 4, Managing Spares](#).

If you do not want a spare, choose **0**.

- 13** Choose a disk drive to use as a dedicated spare, then press **Enter**. Repeat, if you are using multiple dedicated spares.

Only available disk drives (those that are not members of an array or assigned as dedicated or pool spares) display. You can delete a dedicated spare from the array at any time. For more information, see [Deleting a Dedicated Spare on page 4-3](#).

If the array you are creating is a RAID 3, RAID 4, RAID 5, or RAID 50, the Chunk Size screen appears.

If you are creating a different type of array, skip to [Step 15](#).

- 14** Choose the chunk size, then press **Enter**.

*Chunk size* is the amount of contiguous data that is written to an array member. To determine the appropriate chunk size, refer to your OS's documentation. For example, the default chunk size for Windows NT<sup>®</sup> and many other OSs is 64 KB. If you are using the array for a database with very small records, you may want to use a smaller chunk size.

The system asks you to confirm that you want to create an array.

- 15** Choose **Y**, then press **Enter**.

A message notifies you that the array is being created and shows the progress of the initialization process. The array initialization process can take from several minutes to several hours, depending on the array type (volume, RAID 0, and RAID 1 are the fastest), array size, disk drive speed, and other processes running on the controller.

- 16** Press **Esc** to return to the System menu and perform other functions while the initialization continues.

## **Checking the Progress of the Array Initialization**

You can check the progress of the array initialization at any time.

- 1** From the System menu, choose **Array Menu**, then press **Enter**.

The status of the initialization appears in the list of arrays.

- 2** Press **Enter**.

- 3** Use ↑ and ↓ to cycle through the status information that appears.

If you need to change the disk drives or change some other array configuration, you can stop the array initialization process. See [Stopping the Array Initialization Process on page 2-12](#).



**Note:** Most OSs, such as Windows NT 4.0, require you to reboot the host system to see the new array. NetWare v3.12 and later can recognize new devices by typing the command `SCAN FOR NEW DEVICES` at the console prompt. Other OSs might have similar features.

---

## Creating a Multiple-Partition Array

You can create an array that has more than one partition.



**Note:** Once you create a multiple-partition array, you must create at least one partition before you can use the array. See [Adding a Partition on page 2-9](#).

---

Multiple-partition arrays work well when you have very large disk drives and you want to make the most efficient use of disk space for fault tolerance (parity and spares).

- 1 Press **Menu**, choose **Controller Menu**, then press **Enter**.
- 2 Choose the desired controller, then press **Enter**.
- 3 Choose **Array Menu**, then press **Enter**.
- 4 Choose **Add an Array**, then press **Enter**.
- 5 Enter a name for the array. See [Step 5 on page 2-3](#) for detailed instructions.

If you do not want to name the array, press **Enter**. You can add or change the name later.

The system asks if you want to create one partition now for the entire array.



**Note:** If you want to create a single-partition array, see [Creating a Single-Partition Array on page 2-2](#).

---

- 6 Choose **N (No)** to create a multiple-partition array, then press **Enter**.

- 7 Choose the RAID level, then press **Enter**. (You can choose from RAID 0, RAID 3, RAID 4, RAID 5, RAID 50, VOLUME, or MIRRORED.



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**Note:** A RAID 10 array is automatically created when there are more than two disk drives in a mirrored array.

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- If you selected RAID 50 as the array type, the Pick RAID 50 Array Size screen appears.

Choose the configuration you want, press **Enter**, then skip to [Step 10](#).

- If you selected any array type other than RAID 50, the Number of Drives screen appears.

- 8 Enter the number of disk drives in the array, excluding spares, then press **Enter**.

The Select Drives screen is displayed. See [Step 9 on page 2-4](#) for more details.

- 9 Choose a disk drive to use in the array, then press **Enter**. Repeat until all the disk drives you want are selected.

If the array is mirrored, RAID 3, RAID 4, RAID 5, or RAID 50 and you have one or more disk drives left, the Number of Spares screen appears.

If you are creating another type of array, skip to [Step 13](#).

- 10 Choose the number of spares you want to add, then press **Enter**.

This creates dedicated spares that can only be used by this array. A dedicated spare disk drive is not available for any other use. For more information, see [Chapter 4, Managing Spares](#).

If you do not want a spare, enter **0**.

- 11** Choose a disk drive to use as a dedicated spare, then press **Enter**. Repeat, if you are using multiple dedicated spares.

Only available disk drives (those not members of an array or assigned as dedicated or pool spares) display. You can delete a dedicated spare from the array at any time. For more information, see [Deleting a Dedicated Spare on page 4-3](#).

If the array you are creating is a RAID 3, RAID 4, RAID 5, or RAID 50, the Chunk Size screen appears.

If you are creating another type of array, skip to [Step 13](#).

- 12** Choose the chunk size, then press **Enter**. (See [page 2-5](#) for information on chunk size.)

The system asks you to confirm that you want to create an array.

- 13** Choose **Y**, then press **Enter**.

A message notifies you that the array is being created and shows the progress of the initialization process. The array initialization process can take from several minutes to several hours, depending on the array type (volume, RAID 0, and RAID 1 are the fastest), array size, disk drive speed, and other processes running on the controller.

- 14** Press **Esc** to return to the System menu and perform other functions while the initialization continues. See [Checking the Progress of the Array Initialization on page 2-5](#) for information on how to do a status check.

You must create at least one partition before you can use the array. See [Adding a Partition on page 2-9](#).

If you find that you need to change the disk drives or some other array configuration, you can stop the array initialization process. See [Stopping the Array Initialization Process on page 2-12](#).



---

**Note:** Most OSs, such as Windows NT 4.0, require you to reboot the host system to see the new array. NetWare v3.12 and later can recognize new devices by typing the command `SCAN FOR NEW DEVICES` at the console prompt. Other OSs might have similar features.

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## Managing Arrays

Using the OCP, you manage your arrays in a variety of ways. You can

- Add a partition (see [page 2-9](#)).
- View array and disk drive information (see [page 2-10](#)).
- Stop the initialization process (see [page 2-12](#)).
- Verify an array (see [page 2-13](#)).
- Reconstruct an array (see [page 2-15](#)).
- Expand array capacity (see [page 2-15](#)).
- Change the array name (see [page 2-17](#)).
- Change array ownership (see [page 2-18](#)).
- Trust an array (see [page 2-18](#)).
- Delete an array (see [page 2-20](#)).

## Adding a Partition

If you created a multiple-partition array, you must create at least one partition before you can use it. You can continue to create partitions until you use all of the available free space.

- 1 Press **Menu**, choose **Controller Menu**, then press **Enter**.
- 2 Choose the desired controller, then press **Enter**.
- 3 Choose **All Partition**, then press **Enter**.

All existing arrays display.

- 4 Choose the array you want, then press **Enter**.
- 5 Choose **Add a Partition**, then press **Enter**.

All free partitions display.

- 6 Choose the partition you want, then press **Enter**.

- 7 Adjust the size of the partition. You must adjust the place values one at a time.

Use ↑ and ↓ to choose a value, then press **Enter**. Repeat for all place values.

Once all size adjustments are made, press **Enter**.

- 8 **Enter** a name for the partition. See [Step 5 on page 2-3](#) for detailed instructions.




---

**Note:** If you do not want to name the partition, skip this step by pressing **Enter**. You can add or change the name later.

---

- 9 Choose the LUN for the array, then press **Enter**. (Choose any number from 0-63.)

The system warns you about the LUN for Unix and Macintosh OSs. (See the *Note* on [page 2-2](#) for detailed information.) Press **Enter** and the system asks if you want to be warned again. Select **No** to avoid receiving this warning again, otherwise select **Yes** to be warned the next time you create a partition.

The system asks you to confirm that you want to add the array.

- 10 Choose **Y**, then press **Enter**.

Repeat Steps 4–10 for the remaining free partition space (as desired).

## Viewing Array and Disk Drive Information

You can view array status and disk drive status at any time.

### Viewing Array Status

You can view the following information for any array:

- **State**—Online, Offline, Critical, or Fault-tolerant.
- **Serial number**—Unique number the controller assigns to each array.
- **Name**—Name you gave to the array.

- **RAID level**—Array type (0, 3, 4, 5, 50, volume, or mirrored). The term *mirrored* is used for both RAID 1 and RAID 10 arrays.
- **Number of drives**—Number of disk drives in the array when fault-tolerant. For example, if you create a three-drive RAID 5 array and lose one disk drive, the number will still display 3.
- **Number of drives per subarray**—(*RAID 50 only*) Number of disk drives in each underlying RAID 5 array.
- **Number of spare drives**—Number of spare disk drives dedicated to this array.
- **Size**—Size of the entire array (expressed in MB or GB for arrays larger than 10 GB).
- **Chunk size**—Array's chunk size.
- **Date created**—Date the array was created.
- **Utility**—Utility running (None, Verify, Reconstruct, Expand, or Initialize).
- **Number of partitions**—Number of partitions created on the array.
- **Free partition total**—Amount of free space (no partition) on the array.

To view the status of an array

- 1 Press **Menu**, choose **Controller Menu**, then press **Enter**.
- 2 Choose the desired controller, then press **Enter**.
- 3 Choose **Array Menu**, then press **Enter**.
- 4 Choose the array you want, then press **Enter**.
- 5 Choose **Array Status**, then press **Enter**.

The Array Status screen appears showing the status of the array you chose.

- 6 Choose an option, then press **Enter**.

The status information appears.

- 7 Press **Esc** to return to the Array Status screen.
- 8 Repeat Step 6 to choose another option, if desired, or press **Esc** to return to the Array Menu.

## Viewing Disk Drive Status

You can view the following information for the disk drives in an array:

- **Drive number**—The disk drive's sequential position in the controller's disk drive list.
- **Drive status**—Whether the disk drive is up, down, or spare.
- **Channel number**—Back-end disk bus number.
- **Target ID**—The number assigned to each disk drive attached to a SCSI channel (also known as SCSI ID).
- **Size**—Size of the disk drive in MB.
- **Status**—See *Managing Disk Drives on page 6-1*.



**Note:** If a disk drive has failed or malfunctioned, it may not be listed.

---

To view disk drive status

- 1 Press **Menu**, choose **Controller Menu**, then press **Enter**.
- 2 Choose the desired controller, then press **Enter**.
- 3 Choose **Array Menu**, then press **Enter**.
- 4 Choose the array you want, then press **Enter**.
- 5 Choose **Drive Status**, then press **Enter**.
- 6 Choose a disk drive.

The disk drive's status appears.

- 7 Press **Esc** to return to the Array Menu.

## Stopping the Array Initialization Process

If you need to change the disk drives or some other array configuration, you can stop the array initialization process.

After you stop the process, the array is marked as *offline* and cannot be used. You must delete the array before you can use the disk drives in another array.

To stop the array initialization process

- 1 Press **Menu**, choose **Controller Menu**, then press **Enter**.
- 2 Choose the desired controller, then press **Enter**.
- 3 Choose **Array Menu**, then press **Enter**.
- 4 Choose the array you want, then press **Enter**.
- 5 Choose **Abort Initialization**, then press **Enter**.

The system asks if you want to stop the initialization process.

- 6 Choose **Y**, then press **Enter**.

## **Verifying an Array**

You can verify the data on the specified array.

- **RAID 3, RAID 4, RAID 5, and RAID 50**—Verifies all parity blocks in the selected array and corrects any bad parity.
- **Mirrored**—Compares the primary and secondary disk drives. If a mismatch occurs, the primary is copied to the secondary.

You should verify an array when you suspect there is a problem.

- 1 Press **Menu**, choose **Controller Menu**, then press **Enter**.
- 2 Choose the desired controller, then press **Enter**.
- 3 Choose **Array Menu**, then press **Enter**.
- 4 Choose the array you want, then press **Enter**.
- 5 Choose **Verify Function**, then press **Enter**.
- 6 Choose **Start Verify**, then press **Enter**.

Verification begins and the Verify prompt appears displaying the percentage of verification completed. You can continue to use the array during verification.

- 7 Press **Esc** to return to the Verify menu.

## Checking the Progress of the Array Verification

You can check the progress of the array verification at any time. There are two ways to do this:

- See [Viewing Verification Status on page 2-14](#), or
- Select **Array Menu** from the System Menu.

The status of the verification appears in the list of arrays.

## Viewing Verification Status

You can view the status of the verification process while it is running.

- 1 Press **Menu**, choose **Controller Menu**, then press **Enter**.
- 2 Choose the desired controller, then press **Enter**.
- 3 Choose **Array Menu**, then press **Enter**.
- 4 Choose the array you want, then press **Enter**.
- 5 Choose **Verify Function**, then press **Enter**.
- 6 Choose **View Verify Status**, then press **Enter**.
- 7 Press **Esc** to return to the Verify menu.

## Stopping the Verification

You can stop the verification process. Normally, you should let the verification finish, although stopping it does not cause any damage to your data. You may wish to stop the verification if you want to improve performance of the controller for another application.

- 1 Press **Menu**, choose **Controller Menu**, then press **Enter**.
- 2 Choose the desired controller, then press **Enter**.
- 3 Choose **Array Menu**, then press **Enter**.
- 4 Choose the array you want, then press **Enter**.
- 5 Choose **Verify Function**, then press **Enter**.
- 6 Choose **Abort Verify**, then press **Enter**.

The system asks if you want to stop the verification process.

- 7 Choose **Y**, then press **Enter**.

## Reconstructing an Array

The controller automatically reconstructs redundant arrays (RAID 3, RAID 4, RAID 5, RAID 50, and mirrored) if an array becomes critical and a proper-size spare disk drive is available. An array becomes critical when one or more member disk drives fail.

If a reconstruct does not start automatically, it means that no valid spares are available. To start a reconstruct, replace the failed disk drive, and add it as a spare (see [Adding a Dedicated Spare on page 4-2](#) and [Managing the Spare Pool on page 4-4](#)) or as a pool spare (see [Adding a Spare to the Spare Pool on page 4-4](#)). Remember that added pool spares might be used by any critical array, not necessarily the array you want.

## Expanding Array Capacity

You can expand array capacity without stopping I/O activity. You can only expand one array at a time.



**Note:** Expanding an array does not change the size of host OS partitions that reside on the array because the controller is working at the block level, not the file system level, of the OS. To use the new space, create a new partition using the newly added space or use a third-party application specific to the OS to change the partition size.

How you create a new partition or resize an existing one depends upon the OS. Most OSs cannot resize an existing partition. Refer to your OS's documentation.

---

The number of disk drives you can add to an array depends upon the RAID level as shown in [Table 2-2](#). You also cannot exceed the maximum number of disk drives for each RAID level. See [Creating Arrays on page 2-1](#).

Table 2-2. Disk Drive Additions by RAID Level

| RAID Level                      | Number of Disk Drives You Can Add |
|---------------------------------|-----------------------------------|
| RAID 0                          | 1 to 4                            |
| RAID 1 (mirrored)<br>Volume Set | Cannot expand                     |
| RAID 10                         | 2 or 4                            |
| RAID 3, 4, or 5                 | 1 to 4                            |
| RAID 50                         | 3 to 5                            |

If you are expanding a multiple-partition array, you add free space at the end of the array.



**Note:** Once you start expanding array capacity, you cannot stop it. The Expand Function may take an hour or more to complete, depending on the array type, array size, disk drive speed, and other processes running on the controller.

To expand an array

- 1 Press **Menu**, choose **Controller Menu**, then press **Enter**.
- 2 Choose the desired controller, then press **Enter**.
- 3 Choose **Array Menu**, then press **Enter**.
- 4 Choose the array you want, then press **Enter**.
- 5 Choose **Expand Function**, then press **Enter**.
- 6 Choose **Start Expand**, then press **Enter**.
- 7 Choose the number of disk drives you want to add, then press **Enter**.

All available disk drives display.

- 8 Choose a disk drive to add, then press **Enter**. Repeat for every disk drive you want to add.

Expansion begins and the percentage completed appears.

- 9 Press **Esc** to return to the Array menu.

## Checking the Progress of the Array Expansion

You can check the progress of the array expansion at any time. There are two ways to do this

- See [Viewing Expand Status on page 2-17](#), or
- Select **Array Menu** from the System Menu.

The status of the expansion appears in the list of arrays.

## Viewing Expand Status

You can view the status of the expansion process while it is running.

- 1 Press **Menu**, choose **Controller Menu**, then press **Enter**.
- 2 Choose the desired controller, then press **Enter**.
- 3 Choose **Array Menu**, then press **Enter**.
- 4 Choose the array you want, then press **Enter**.
- 5 Choose **Expand Function**, then press **Enter**.
- 6 Choose **View Expand Status**, then press **Enter**.
- 7 Press **Esc** to return to the Expand menu.

## Changing an Array Name

You can change the name of the array. This does not affect the target ID or LUN values of the array. The controller does not allow you to change an array name when a utility is running.

- 1 Press **Menu**, choose **Controller Menu**, then press **Enter**.
- 2 Choose the desired controller, then press **Enter**.
- 3 Choose **Array Menu**, then press **Enter**.
- 4 Choose the array you want, then press **Enter**.
- 5 Choose **Change Array Name**, then press **Enter**.
- 6 Enter the new name. See [Step 5 on page 2-3](#) for instructions.

The system asks you to confirm the change.

- 7 Choose **Y**, then press **Enter**.

## Changing Array Ownership

If you are using active-active mode, you can change the ownership of any array between controllers.

You might want to change ownership if you plan to replace or repair one controller. Changing ownership lets you continue using an array without interruption, and makes the array visible on the controller you change it to and not visible on the original controller.




---

**Note:** When you change the ownership of an array, the LUNs assigned to the array's partitions become invalid. After changing ownership, you must assign a new LUN to each array partition.

---

To change ownership of an array:

- 1 Press **Menu**, choose **Controller Menu**, then press **Enter**.
- 2 Choose the desired controller, then press **Enter**.
- 3 Choose **Array Menu**, then press **Enter**.
- 4 Choose the array you want, then press **Enter**.
- 5 Choose **Switch Array Owner**, then press **Enter**.

The system asks you to confirm the change.

- 6 Choose **Y**, then press **Enter**.
- 7 Assign a new LUN to each array partition. See [Changing a Partition LUN on page 2-25](#).

## Trusting an Array

The Trust Array Function brings an array back online by resynchronizing the time and date stamp and any other metadata on a bad disk drive. This makes the disk drive an active member of the array again. You might need to do this when

- One or more disk drives of an array start up more slowly or were powered on after the rest of the disk drives in the array. This causes the date and time stamps to differ, which the controller interprets as a problem with the late disk drives. In this case, the array will function normally after using Trust Array.

- An array is offline because a disk drive is failing, you have no data backup, and you want to try to recover the data from the array. In this case, the Trust Array Function may work, but only as long as the failing disk drive continues to operate.

Before you can use the Trust Array Function, you must enable it in the Option Configuration Menu.



**Caution:** The Trust Array Function can cause unstable operation and data loss if used improperly. This function is intended for disaster recovery.

---

### **Enabling the Trust Array Function**

- 1 Press **Menu**, choose **Controller Menu**, then press **Enter**.
- 2 Choose the desired controller, then press **Enter**.
- 3 Choose **Configuration Menu**, then press **Enter**.
- 4 Choose **Option Configuration**, then press **Enter**.
- 5 Choose **Enable Trust Array**, then press **Enter**.
- 6 Choose **Enable**, then press **Enter**.



**Note:** The option is only enabled until you use it. After you trust an array, the option reverts back to being disabled.

---

- 7 Press **Esc** twice to return to the System Menu.

To trust an array

- 1 From the System menu, choose **Array Menu**, then press **Enter**.

A list of existing arrays appears.

- 2 Choose the array you want, then press **Enter**.
- 3 Choose **Trust Array**, then press **Enter**.

The system asks you to confirm that you want to trust the array.

- 4 Choose **Y**, then press **Enter**.

The array comes back online.



---

**Note:** If the array does not come back online, too many members may be offline or the array may have additional failures on the bus or enclosure that Trust Array Function cannot fix.

---

## Deleting an Array

You can delete an array when you no longer need the array or you need the disk drives for another use.



---

**Caution:** When you delete an array, you delete all partitions and data contained in the array; however, before reusing the disk drives you should perform a low-level format on them.

---



---

**Note:** You cannot delete an array while any utility is running on the array. You must stop the utility, if possible, or let it finish, before you can delete the array.

---

To delete an array

- 1 Press **Menu**, choose **Controller Menu**, then press **Enter**.
- 2 Choose the desired controller, then press **Enter**.
- 3 Choose **Delete an Array**, then press **Enter**.
- 4 Choose the array you want to delete, then press **Enter**.

The system asks you to confirm the deletion.

- 5 Choose **Y**, then press **Enter**.

## Managing Partitions

Using the OCP, you can manage partitions in a variety of ways. You can

- View partition status information (see [page 2-21](#)).
- Add a partition (see [page 2-9](#)).
- Expand a partition (see [page 2-24](#)).
- Change a partition name (see [page 2-24](#)).
- Change a partition LUN (see [page 2-25](#)).
- Delete a partition (see [page 2-25](#)).

### Viewing Partition Status Information

You can perform three functions related to partition status. You can

- View partition status (see [page 2-21](#)).
- View partition statistics (see [page 2-22](#)).
- Reset partition statistics (see [page 2-23](#)).

### Viewing Partition Status

You can view the status of a partition, including the following information:

- **Array state**—Online, Offline, Critical, or Fault-tolerant.
- **Array type**—RAID level (0, 3, 4, 5, 50, volume, or mirrored). The term *mirrored* is used for both RAID 1 and RAID 10 arrays.
- **Array drives**—Number of disk drives in the array when fault-tolerant. For example, if you create a 3-drive RAID 5 array and lose one disk drive, the number will still display 3.
- **Name**—Name you give to the partition.
- **Serial number**—Unique number the controller assigns to each partition.
- **Target ID:LUN**—Target ID and LUN presented to the host system.
- **Partition size**—Size of the partition (expressed in MB).

- **Percentage of total array**—The percentage of the total array that this partition represents.
- **Write-back caching**—Status of the write-back cache (enabled or disabled) for this array.

To view the status of a partition

- 1 Display the Partition Menu. See [Table 2-3](#):

Table 2-3. Displaying the Partition Menu

| From the Array Menu                                                          | From the All Partitions Menu                                                          |
|------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| 1 From the System Menu, choose <b>Array Menu</b> , then press <b>Enter</b> . | 1 From the System Menu, choose <b>All Partitions Menu</b> , then press <b>Enter</b> . |
| 2 Choose the array you want, then press <b>Enter</b> .                       | 2 Choose the partition you want, then press <b>Enter</b> .                            |
| 3 Choose <b>Partition Menu</b> , then press <b>Enter</b> .                   |                                                                                       |
| 4 Choose the partition you want, then press <b>Enter</b> .                   |                                                                                       |

The Partition Menu screen appears.

- 2 Choose **Partition Status**, then press **Enter**.

The status screen displays the status of the partition you selected.

- 3 Press **Esc** to return to the Partition Menu.

## Viewing Partition Statistics

You can view these statistics for current partitions:

- **Read**—Total number of host read requests directed to the partition.
- **Write**—Total number of host write requests directed to the partition.
- **SecRd**—Total number of sectors read from the partition.
- **SecWt**—Total number of sectors written to the partition.
- **Queue depth**—Current number of commands from the host that are queued up.
- **I/O size**—Last host I/O block size request in 512-byte sectors.

Similar statistics are also available on an aggregate basis for all partition LUNs. See [Displaying Overall Statistics on page 3-4](#).

To view the partition statistics

- 1 Display the Partition Menu. See Step 1 on [page 2-22](#).
- 2 Choose **Partition Statistics**, then press **Enter**.
- 3 Choose **View Statistics**, then press **Enter**.  
Use **↑** and **↓** to cycle through the available statistics choices.
- 4 Press **Esc** to return to the Statistics menu.

## Resetting Partition Statistics

You can reset the following partition statistics to zero:

- Read
- Write
- SecRd
- SecWt
- I/O size



**Note:** When you reset a partition's statistics, the aggregate statistics for that partition are also reset. See [Displaying Overall Statistics on page 3-4](#).

---

You may want to reset partition statistics if you are monitoring performance or doing benchmark testing, or when you are changing how you use the partition.



**Note:** You cannot reset the queue depth value. It always reflects the current I/O queue depth.

---

To reset partition statistics

- 1 Display the Partition Menu. See Step 1 on [page 2-22](#).
- 2 Choose **Partition Statistics**, then press **Enter**.
- 3 Choose **Reset Statistics**, then press **Enter**.

The system asks you to confirm the change.

- 4 Choose **Y**, then press **Enter**.

The system confirms that the statistics have been cleared and returns to the Statistics menu.

## **Expanding a Partition**

You can expand an existing partition, with some limitations—you can only expand a partition into adjacent free space that follows the partition.

- 1 Display the Partition Menu. See Step 1 on [page 2-22](#).
- 2 Choose **Expand Partition**, then press **Enter**.
- 3 Adjust the size of the partition. You must adjust the place values one at a time.  
Use  $\uparrow$  and  $\downarrow$  to choose a value, then press **Enter**. Repeat for all place values.
- 4 Once all size adjustments are made, press **Enter**.  
The system asks you to confirm the change.
- 5 Choose **Y**, then press **Enter**.

## **Changing a Partition Name**

You can change the name of a partition without affecting its target ID or LUN values. You can only change a partition name when no utilities are running.

- 1 Display the Partition Menu. See Step 1 on [page 2-22](#).
- 2 Choose the partition you want, then press **Enter**.
- 3 Choose **Change Partition Name**, then press **Enter**.
- 4 Enter a name for the partition. See [Step 5 on page 2-3](#) for detailed instructions.  
The system asks you to confirm the change.
- 5 Choose **Y**, then press **Enter**.

## Changing a Partition LUN

You can change the LUN assigned to a partition as it appears under the controller's target ID from the host system's point of view. The change takes place immediately; however, you may need to reboot the host system to see the partition at the new LUN.



---

**Note:** You cannot change the partition's LUN to one that is already in use. If you want to use a LUN that is already in use, you must first reassign the LUN in use.

---

To change a partition LUN

- 1 Display the Partition Menu. See Step 1 on [page 2-22](#).
- 2 Choose **Change LUN**, then press **Enter**.
- 3 Choose the LUN for the array, then press **Enter**. (Choose any number from 0–63.)

The system asks you to confirm the change.

- 4 Choose **Y**, then press **Enter**.

## Deleting a Partition

You can delete a partition when you no longer need it and you want to use the space for another purpose.



---

**Caution:** Deleting a partition deletes all data contained in the partition.

---



---

**Note:** You cannot delete a partition while any utility is running on the array. You must stop the utility, if possible, or let it finish, before you can delete the partition.

---

To delete a partition

- 1 Display the Partition Menu. See Step 1 on [page 2-22](#).
- 2 Choose **Delete This Partition**, then press **Enter**.
- 3 Choose **Y**, then press **Enter**.

The Delete Partition option is also available on the Array Menu.

## Setting Host LUN IDs

- 1 Press **Menu**, choose **Controller Menu**, then press **Enter**.
- 2 Choose the desired controller, then press **Enter**.
- 3 Choose **Config Menu**, then press **Enter**.
- 4 Choose **Host Config**, then press **Enter**.
- 5 Press **Enter**.
- 6 Change the ID, then press **Enter**.  
Choose any number between 0 and 15.
- 7 Press **Enter** to accept the default Controller LUN.
- 8 Choose **Y**, then press **Enter**.
- 9 Restart the controller for the changes to take effect. See [Rebooting the Controller on page 5-2](#) for instructions.

# Monitoring System Status

You can monitor your system regularly to ensure that the controller, disk drives, and arrays are working properly by:

- Using the Event Log to view the 400 most recent events. See [page 3-1](#).
- Using the Hardware menu to view the Activity, Power, Fans, and Mode screens. See [page 3-2](#).
- Using the Utilities menu to view hardware information and system statistics. See [page 3-4](#).

## Using the Event Log

The controller's event log contains important information about the status of the controller, disk drives, and arrays. You should check it regularly to monitor the status of your system. For more information about specific warning and error events, see [Warning and Error Events on page 7-6](#). For information about specific SCSI disk drive and channel errors, see [Understanding SCSI Errors on page 7-9](#).

The event log stores the most recent 400 events. Events are numbered sequentially from 001 to 999. The numbering wraps back to 001 after reaching 999.



---

**Note:** If you are having a problem with the controller or an array, check the event log before calling technical support. Event messages may let you resolve the problem on your own. You should also check [Chapter 7, Troubleshooting](#).

---

## Viewing the Event Log

You can view controller-related events one at a time. The events display in reverse chronological order (the most recent event first).

- 1 Press **Menu** and choose the desired hardware, then press **Enter**.
- 2 Choose **Event Log Menu**, then press **Enter**.
- 3 Press **Enter** again to view the event log.
- 4 Use **↑** and **↓** to cycle through the list of events. To view an event, press **Enter**.
- 5 To view detailed information about the displayed event, press **Enter**.

To view additional information about the specific event, continue pressing **Enter**.

- 6 Press **Esc** to return to the previous menu.

## Using the Hardware Menu

Five screens are accessible from the Hardware menu:

- Activity screen
- Firmware screen
- Power screen
- Fans screen
- Mode screen

## Accessing the Hardware Menu

- 1 Press **Menu**.
- 2 Choose **Hardware Menu**, then press **Enter**.

## Viewing the Activity Screen

The Activity screen displays the activity levels of drive channel data on the bus. It shows which channels and controllers are active.

- 1 Press **Menu** and choose the desired hardware, then press **Enter**.
- 2 Choose **Activity**, then press **Enter**.

- 3 Choose the controller you wish to monitor.

The drive channels will immediately display the activity for that controller. The display will show drive channels as CH [1] and CH [2]. The value in the brackets is the channel number.

- 4 Press **Esc** to return to previous menu.

## Viewing the Power Screen

The Power screen displays the status of the installed power supplies. The controller will illuminate the Fault LED for a low or high voltage condition.



---

**Caution:** Loss of one power supply will put your DuraStor 6200SR RAID appliance in a non-fault tolerant condition. Failure of both power supplies will result in data loss.

---

To view the Power screen

- 1 Press **Menu** and choose the desired hardware, then press **Enter**.
- 2 Choose **Power**, then press **Enter**.

The power supplies and their status display.

- 3 Press **Esc** to return to previous menu.

## Viewing the Fans Screen

- 1 Press **Menu** and choose the desired hardware, then press **Enter**.
- 2 Choose **Fans**, then press **Enter**.

The status of the cooling fans appears.

- 3 Press **Esc** to return to previous menu.

## Viewing the Mode Screen

The Mode screen sets the input mode choice from the OCP to the terminal keyboard (VT-100). This setting works in conjunction with the Ext/Int switch located on the I/O connectivity panel of the DuraStor 6200SR RAID appliance. This OCP setting and the I/O connectivity panel switch setting must match, otherwise neither the OCP buttons nor the VT-100 keyboard will work.

To view the Mode screen

- 1 Press **Menu** and choose the desired hardware, then press **Enter**.
- 2 Choose **Mode**, then press **Enter**.
- 3 Choose the mode, then press **Enter**. (Be sure to set the Ext/Int switch on the I/O connectivity panel to match.)
- 4 Press **Esc** to return to previous menu.

## Using the Utilities Menu

### Displaying Hardware Information

- 1 Press **Menu**, choose **Controller Menu**, then press **Enter**.
- 2 Choose the desired controller, then press **Enter**.
- 3 Choose **Utilities Menu**, then press **Enter**.
- 4 Choose **Hardware Information**, then press **Enter**.
- 5 Use **↑** and **↓** to cycle through the hardware information.
- 6 Press **Esc** to return to the Utilities Menu.

### Displaying Overall Statistics

Aggregate statistics for all partition LUNs can be displayed in two formats:

- List of general statistics. (Similar statistics are also available for individual partition LUNs. For more information, see [Viewing Partition Statistics on page 2-22](#).)
  - I/O operations per second (IOPS)
  - Bandwidth (in millions of bytes per second)
  - Number of read operations

- Number of write operations
  - Total sectors (512 bytes) read
  - Total sectors written
  - Total current command queue depth across all LUNs
- Histogram of host reads/writes. This shows how many host reads and writes fell into a particular size range.

### **Accessing the General Array Statistics**

- 1 Press **Menu**, choose **Controller Menu**, then press **Enter**.
- 2 Choose the desired controller, then press **Enter**.
- 3 Choose **Utilities Menu**, then press **Enter**.
- 4 Choose **Overall Statist**, then press **Enter**.
- 5 Choose **View Statistics** and press **Enter**.
- 6 Press **Enter** again.
- 7 Use **↑** and **↓** to cycle through the statistics options. (See [page 3-4](#) for the list of available options.)
- 8 Press **Esc** to return to the Overall Statist screen.

### **Accessing the Read/Write Histogram**

- 1 From the System Menu, choose **Utilities Menu**, then press **Enter**.
- 2 Choose **Overall Statist**, then press **Enter**.
- 3 Choose **View Histogram**, then press **Enter**.
- 4 Press **Enter** to view the histogram.
- 5 Press **Esc** to return to the Overall Statist screen.

## Resetting Overall Statistics

You can reset all of the overall statistics back to zero, which you may want to do if you are monitoring performance.



---

**Note:** Resetting overall statistics also resets the statistics for each individual partition. See [Resetting Partition Statistics on page 2-23](#).

---

To reset overall statistics

- 1 Press **Menu**, choose **Controller Menu**, then press **Enter**.
- 2 Choose the desired controller, then press **Enter**.
- 3 Choose **Utilities Menu**, then press **Enter**.
- 4 Choose **Overall Statist**, then press **Enter**.
- 5 Choose **Reset All Stat**, then press **Enter**.

The system asks you to confirm the change.

- 6 Choose **Y**, then press **Enter**.

The system confirms that the statistics have been cleared and returns to the Overall Statist screen.

## Managing Spares

DuraStor RAID controllers automatically reconstruct redundant (fault-tolerant) arrays (RAID 3, RAID 4, RAID 5, RAID 50, and mirrored) if an array becomes critical and a proper-size spare disk drive is available. An array becomes critical when one or more member disk drives fail.

You can set up two types of spare disk drives:

- **Dedicated**—Available disk drive that is assigned to a specific array (see [page 4-1](#)).
- **Pool**—Available disk drive that is assigned to the spare pool, which can provide a spare for any failed disk drive in any redundant array. In active-active mode, pool spares are available to both controllers. If a disk drive in an array on either controller fails, the controller can use a pool spare to reconstruct the array (see [page 4-4](#)).

You can also choose to enable the Dynamic Spares option. (See [page 4-3](#).)

### Managing Dedicated Spares

Dedicated spares are unused disk drives that you assign as a spare to a specific array. Each disk drive must be as large as the smallest member of the array. You cannot use a dedicated spare in an array or as a pool spare.

Using a dedicated spare is the most secure way to provide spares for your arrays but it is also expensive to keep an idle disk drive assigned to each array. An alternative, more efficient method is to assign one or more idle disk drives to the spare pool. See [Managing the Spare Pool on page 4-4](#).

## Adding a Dedicated Spare

You assign dedicated spares to a specific array. If a member disk drive in the array fails, the controller uses a dedicated spare to automatically reconstruct the array. You can add dedicated spares to mirrored and parity arrays as you create the array or afterward. You can assign up to four dedicated spares to an array. For more information about assigning spares when you create an array, see [Creating Arrays on page 2-1](#).



**Note:** A spare cannot be assigned to an array if it does not have enough capacity to replace the smallest member in the array.

---

To add a dedicated spare

- 1 Press **Menu**, choose **Controller Menu**, then press **Enter**.
- 2 Choose the desired controller, then press **Enter**.  
All existing arrays display.
- 3 Choose the array you want to add a dedicated spare to, then press **Enter**.
- 4 Choose **Add Spare**, then press **Enter**.  
All available drives display.
- 5 Choose the drive you want as a spare, then press **Enter**.



**Note:** If a disk drive was a member of an array and was removed from that array, you cannot use it as a spare until you clear the its metadata. See [Clearing Metadata from a Disk Drive on page 6-3](#)

---

The system asks you to confirm the change.

- 6 Choose **Y**, then press **Enter**.

## Deleting a Dedicated Spare

You can delete a dedicated spare from an array at any time.

- 1 Press **Menu**, choose **Controller Menu**, then press **Enter**.
- 2 Choose the desired controller, then press **Enter**.
- 3 Choose **Array Menu**, then press **Enter**.

All existing arrays display.

- 4 Choose the array you want to delete a dedicated spare from, then press **Enter**.
- 5 Choose **Delete Spare**, then press **Enter**.
- 6 Choose the spare you want to delete, then press **Enter**.

The system asks you to confirm the deletion.

- 7 Choose **Y**, then press **Enter**.

The drive is now available for use in an array or as a spare.

## Enabling Dynamic Spares

Using the Dynamic Spares option, you can use all of your disk drives in redundant arrays without assigning one as a spare. For example, with Dynamic Spares enabled, if a drive fails and you replace it, the controller automatically finds the new drive and reconstructs the array.

With Dynamic Spares enabled, if you have spares or available drives, the controller first looks for a dedicated or spare pool drive for the reconstruction. If none is found, it uses an available drive, which it automatically assigns as a spare and starts reconstruction.

You must make sure that the new or available drive has enough capacity to replace the smallest member in the array and does not contain metadata. See [Clearing Metadata from a Disk Drive on page 6-3](#).




---

**Note:** Performance in systems without a SAF-TE Enclosure Processor (SEP) will decrease if an array becomes critical with this option enabled and there are no available drives for a reconstruction. Minimize the performance impact by increasing the rescan rate.

---

To enable dynamic spares

- 1 Press **Menu**, choose **Controller Menu**, then press **Enter**.
- 2 Choose the desired controller, then press **Enter**.
- 3 Choose **Config Menu**, then press **Enter**.
- 4 Choose **Option Config**, then press **Enter**.
- 5 Choose **Dynamic Spare**, then press **Enter**.
- 6 Choose **Enabled**, then press **Enter**.
- 7 Use  $\uparrow$  and  $\downarrow$  to enter the rescan rate in minutes.

The *rescan rate* tells the controller how often to look for an available drive by rescanning the bus. Remember that rescanning the bus frequently can affect performance. If you have an SEP, the dynamic spare configuration will not rescan the bus—the SEP will detect the new drive and tell the controller to rescan; the rescan rate you set here will not affect the system.

- 8 The system asks you to confirm the change.
- 9 Choose **Y**, then press **Enter**.

## Managing the Spare Pool

Disk drives in the spare pool are available for the reconstruction of redundant arrays. Once you assign a disk drive to the spare pool, it is not available for use as an array member or as a dedicated spare.

In active-active mode, pool spares are available to both controllers. If a disk drive in an array on either controller fails, the controller can use a pool spare to reconstruct the array.

If a pool spare is too small (smaller than an individual member in an array), the controller cannot use it to reconstruct the array.

## Adding a Spare to the Spare Pool

You can add up to eight disk drives to the spare pool to reconstruct any critical array on the controller. After an array has started using a pool spare, other critical arrays are prevented from using it.

To add a spare to the spare pool

- 1 Press **Menu**, choose **Controller Menu**, then press **Enter**.
- 2 Choose the desired controller, then press **Enter**.
- 3 Choose **Pool Spare Menu**, then press **Enter**.
- 4 Choose **Add Pool Spare**, then press **Enter**.
- 5 Choose a drive to add to the spare pool, then press **Enter**.

Repeat, if you are adding more than one drive to the spare pool.

The system asks you to confirm the change.

- 6 Choose **Y**, then press **Enter**.

## **Deleting a Spare from the Spare Pool**

- 1 Press **Menu**, choose **Controller Menu**, then press **Enter**.
- 2 Choose the desired controller, then press **Enter**.
- 3 Choose **Pool Spare Menu**, then press **Enter**.
- 4 Choose **Del Pool Spare**, then press **Enter**.
- 5 Choose the pool spare you want to delete, then press **Enter**.

The system asks you to confirm the change.

- 6 Choose **Y**, then press **Enter**.

## **Displaying the Spare Pool**

- 1 Press **Menu**, choose **Controller Menu**, then press **Enter**.
- 2 Choose the desired controller, then press **Enter**.
- 3 Choose **Pool Spare Menu**, then press **Enter**.
- 4 Choose **Disp Pool Spare**, then press **Enter**.

All disk drives assigned to the spare pool display.

- 5 Press **Esc** to return to the Pool Spare menu.

# Configuring the RAID Controller

You can use the OCP to perform the following controller-related tasks:

- Reboot the controller (see [page 5-2](#)).
- Change the date and time (see [page 5-2](#)).
- Configure the host channels (see [page 5-3](#)).
- Configure the SCSI channels (see [page 5-5](#)).
- Change the operating mode (see [page 5-8](#)).
- Manage the other controller (see [page 5-8](#)).
- Change the alarm mute setting (see [page 5-11](#)).
- Lock the cache setting (see [page 5-13](#)).
- Enable and disable the battery (see [page 5-13](#)).
- Change the utility priority (see [page 5-14](#)).
- Rescan all channels (see [page 5-14](#)).
- Pause I/O (see [page 5-15](#)).
- Restore the default settings (see [page 5-16](#)).

## Rebooting the Controller

You may need to shut down and restart the controller after you make certain configuration changes or when you move the controller or make hardware changes.

We strongly recommend that you shut down the controller gracefully (by following these steps) and *do not* just turn off the power. A normal shutdown ensures that the write-back cache has been flushed to the disk.



---

**Caution:** Anyone accessing an array when you shut down the controller will lose access and may lose data.

---

To shut down and restart the controller

- 1 Press **Menu**, choose **Controller Menu**, then press **Enter**.
- 2 Choose the desired controller, then press **Enter**.
- 3 Choose **Shutdown/Restart** and press **Enter**.

The system asks you to confirm that you want to shut down

- 4 Choose **Y**, then press **Enter**.

The system confirms that it has shut down.

- 5 Press **Enter** to reboot.

The system performs its self-test. When you see the OCP initial screen, the controller is ready.

## Changing the Date and Time

To set the controller's date

- 1 Press **Menu**, choose **Controller Menu**, then press **Enter**.
- 2 Choose the desired controller, then press **Enter**.
- 3 Choose **Config Menu**, then press **Enter**.
- 4 Choose **Set Date/Time**, then press **Enter**.
- 5 Choose **Set Date**, then press **Enter**.

- 6 Use **↑** and **↓** to enter the date you want, then press **Enter**. Enter the date in the following format: MM/DD/YYYY.

The system asks you to confirm the change.

- 7 Choose **Y**, then press **Enter**.

The system confirms that the changes are made.

- 8 Press **Esc** to return to the Configuration Menu.

To set the controller's time

- 1 Press **Menu**, choose **Controller Menu**, then press **Enter**.

- 2 Choose the desired controller, then press **Enter**.

- 3 Choose **Config Menu**, then press **Enter**.

- 4 Choose **Set Date/Time**, then press **Enter**.

- 5 Choose **Set Time**, then press **Enter**.

- 6 Use **↑** and **↓** to enter the time you want, then press **Enter**. Enter the date using a 24-hour clock in the following format:  
hh:mm:ss.

The system asks you to confirm the change.

- 7 Choose **Y**, then press **Enter**.

The system confirms that the changes are made.

- 8 Press **Esc** to return to the Configuration Menu.

## Configuring the Host Channels

You can configure the settings for each host channel individually. The settings available for configuration vary based on which mode you are using. [Table 5-1](#) lists the host channel settings, when they are available, and what they do.

Table 5-1. Host Channel Settings

| Host Channel Setting | Modes Available         | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|----------------------|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Enable/Disable       | Stand-alone single-port | You should not disable the host channel when in single-port mode.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                      | Stand-alone dual-port   | In dual-port mode, you can disable a channel when you plan to shut down the host on that channel.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| SCSI ID              | All modes               | You may need to change the host channel's SCSI target ID when you have existing devices at ID 1 (the default), or when you are adding more than one controller to a system. You can set the target ID to any number between 0 and 15.                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Controller LUN       | All                     | <p>The controller has just one LUN that you can change when you configure the host channels. You only need to assign a controller LUN if you are using the Configuration Application Program Interface (CAPI) to configure the controller over a host channel via SCSI protocol extensions. You have two options for setting the LUN:</p> <ul style="list-style-type: none"> <li>■ None—Use this setting if you are not using CAPI to configure the controller. (This change takes effect immediately unless the controller LUN is currently in use.)</li> <li>■ Any number between 0 and 63—Select a specific number if you want the controller's LUN to stay the same when you reboot.</li> </ul> |
| Reset on Failover    | Active-active           | Turn this option on (select <b>ON/OFF</b> ) if you find that failover takes a long time. This option tells the controller to reset the SCSI bus after a failover and speeds failover in some situations.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

To configure the host channels

- 1 Press **Menu**, choose **Controller Menu**, then press **Enter**.
- 2 Choose the desired controller, then press **Enter**.
- 3 Choose **Config Menu**, then press **Enter**.

If the controller is in stand-alone dual-port mode, the Channel menu appears. Select the channel you want to configure and press **Enter**.

The next menu displayed depends upon the mode you are using. An \* appears next to the current setting in each menu. See [Table 5-1](#) for information about each setting.

- 4 Choose the setting you want from each screen and press **Enter**.

The system asks you to confirm the change.

- 5 Choose **Y**, then press **Enter**.

## Configuring the SCSI Channels

You can change three channel configuration options for each SCSI channel:

- **Bus Speed**—This is the maximum speed the controller will attempt to negotiate.
  - 160 MB/sec—Default setting (DT clocking)
  - 80 MB/sec (ST clocking)
  - 40 MB/sec (ST clocking)




---

**Note:** If you have disk drives that are not Ultra160 capable and you experience disk channel problems, you should set the bus speed to 80 MB/sec. Not all disk drives can handle the Ultra160 bus speed.

---

- **Initiator ID**—SCSI ID assigned to each channel of the controller. The default ID is 6 for Channel 1 and 7 for Channel 2. You may need to change the initiator ID if the default conflicts with a SEP ID. You can set the ID to any number between 0 and 15. (In active-active mode, the initiator ID cannot be changed.)

- **Domain Validation**—Checks for disk channel hardware and cable problems to ensure that your system can run at Ultra160 speed. Some disk drives do not support this function and return false problems. You should disable the function in those situations.

To configure the SCSI channels

- 1 Press **Menu**, choose **Controller Menu**, then press **Enter**.
- 2 Choose the desired controller, then press **Enter**.
- 3 Choose **Config Menu**, then press **Enter**.
- 4 Choose **Channel Config**, then press **Enter**.
- 5 Choose the channel you want, then press **Enter**.

The Bus Speed screen appears. The current setting is marked with an \* next to it.

- 6 Choose the bus speed setting you want, then press **Enter**.
- 7 Choose to disable or enable Domain Validation, then press **Enter**.

If the system is not in active-active mode, the Initiator ID screen is displayed showing the current initiator ID. (If the system is in active-active mode, the Initiator ID cannot be changed.)

- 8 Choose the initiator ID you want to use, then press **Enter**.

The system asks you to confirm the change.

- 9 Choose **Y**, then press **Enter**.

The system confirms that the changes are made.

- 10 Press **Esc** to return to the Configuration Menu.

## **Working with the Operating Modes**

Your controller can operate in three different modes:

- **Active-active**—Two controllers cooperate in system operation in a fault-tolerant manner. If one controller fails, the other controller takes over the failed controller's work, providing another level of redundancy and allowing host access to continue.

To run two controllers in active-active mode, the following must be true:

- You must have two controllers installed in a proper configuration.
  - Both controllers must be loaded with compatible firmware levels. The system automatically detects firmware incompatibilities and halts the boot of the second controller.
  - The operating mode of each controller must be set to active-active. See [Changing the Operating Mode on page 5-8](#).
  - Host channel 0 of each controller must be set to a different ID only if you are using a single host interface. If you are using two host connections, then each controller's host channel 0 can have the same ID.
- **Stand-alone dual-port**—A single controller operating with two host ports. This mode allows the host to achieve greater throughput by balancing I/O operations across the two host ports. Host port fault tolerance is also achieved, because the host can continue to access the controller if one host channel fails. The same LUNs display on the two separate host ports.



**Caution:** The host OS and disk drivers must support dual-port accesses for this mode to be used effectively. If the host system does not support dual-port access, *do not* configure the controller in dual-port mode—the OS may believe that a single LUN is really two independent arrays, which may result in data corruption.

---

- **Stand-alone single-port**—A single controller operating with one host port and three disk channels. Use this mode if you do not want to run in dual-port mode, or if your host OS does not support it.



**Note:** If you select stand-alone single-port mode, SCSI channel 3 will not be available if it has been disabled in the Flash Utility.

---

## Changing the Operating Mode

- 1 Press **Menu**, choose **Controller Menu**, then press **Enter**.
- 2 Choose the desired controller, then press **Enter**.
- 3 Choose **Config Menu**, then press **Enter**.
- 4 Choose **Option Config**, then press **Enter**.
- 5 Choose **Operating Mode**, then press **Enter**.
- 6 Choose the operating mode you want, then press **Enter**.  
The system asks you to confirm the change.
- 7 Choose **Y**, then press **Enter**.  
The system confirms that the changes are made.
- 8 Press **Esc** to return to the Option Configuration Menu.



---

**Note:** You must reboot the controller for the change to take effect. See [Rebooting the Controller on page 5-2](#).

---

## Managing the Other Controller

If you are using active-active mode, you can

- Display information about the other controller (see [page 5-8](#)).
- Shut down the other controller (see [page 5-9](#)).
- Shut down both controllers ([page 5-9](#)).
- Kill the other controller (see [page 5-10](#)).
- Unkill the other controller (see [page 5-10](#)).

You can also change the ownership of an array between controllers. See [Changing Array Ownership on page 2-18](#).

## Displaying Information about the Other Controller

You can view information about the other controller. If the other controller is up, its current status is shown; if the other controller is down, its last known state is shown. If the other controller never communicated with the local controller since boot up, most fields will display **Unknown** or something similar.

To display information about the other controller

- 1 Press **Menu**, choose **Controller Menu**, then press **Enter**.
- 2 Choose the desired controller, then press **Enter**.
- 3 Choose **Other Controller Menu**, then press **Enter**.
- 4 Choose **Other Information**, then press **Enter**.
- 5 Use **↑** and **↓** to cycle through the list of other information.
- 6 Press **Esc** to return to the Other Controller Menu.

## **Shutting Down the Other Controller**

You can gracefully shut down the other controller if you are preparing to replace it or power off the RAID appliance. Always use the Shutdown Other Function in preference to the Kill Other Function. (See [Killing the Other Controller on page 5-10](#) for details on when to use the Kill Other Function.)

- 1 Press **Menu**, choose **Controller Menu**, then press **Enter**.
- 2 Choose the desired controller, then press **Enter**.
- 3 Choose **Other Controller Menu**, then press **Enter**.
- 4 Choose **Shutdown Other**, then press **Enter**.

The system asks you to confirm the change.

- 5 Choose **Y**, then press **Enter**.

The other controller shuts down gracefully.

- 6 Press **Esc** to return to the Other Controller Menu.

## **Shutting Down Both Controllers**

You can gracefully shut down both controllers simultaneously if you are preparing to replace them both or power off the RAID appliance.

- 1 Press **Menu**, choose **Controller Menu**, then press **Enter**.
- 2 Choose the desired controller, then press **Enter**.
- 3 Choose **Other Controller Menu**, then press **Enter**.
- 4 Choose **Shutdown Both**, then press **Enter**.

The system asks you to confirm the shutdown.

- 5 Choose **Y**, then press **Enter**.

Both controllers shut down gracefully.

- 6 Press **Esc** to return to the Other Controller Menu.

## Killing the Other Controller

You can *kill* the other controller (nongracefully shut it down), which causes the local controller to assume control of its resources.



---

**Caution:** You should only use the Kill Other Function as a *last resort* to regain control of the other controller. Using Kill Other may disrupt host I/O activity. If the other controller needs to be taken offline, you should first try a local shutdown or use the Shutdown Other Function.

---

To kill the other controller

- 1 Press **Menu**, choose **Controller Menu**, then press **Enter**.
- 2 Choose the desired controller, then press **Enter**.
- 3 Choose **Other Controller Menu**, then press **Enter**.
- 4 Choose **Kill Other**, then press **Enter**.

The system asks you to confirm the change.

- 5 Choose **Y**, then press **Enter**.

The system confirms that the changes are made.

- 6 Press **Esc** to return to the Other Controller Menu.

## Unkilling the Other Controller

You can *unkill* the other controller (bring it back online) by allowing it to complete booting. This option is primarily used to allow a controller that was previously killed (either due to errors or manual action) to come back online.



---

**Note:** If the other controller was unplugged then plugged back in or replaced by a different controller, the surviving controller will automatically unkill the other controller.

---

To unkill the other controller

- 1 Press **Menu**, choose **Controller Menu**, then press **Enter**.
- 2 Choose the desired controller, then press **Enter**.
- 3 Choose **Other Controller Menu**, then press **Enter**.
- 4 Choose **Unkill Other**, then press **Enter**.

The system asks you to confirm the change.

- 5 Choose **Y**, then press **Enter**.

The other controller boots.

- 6 Press **Esc** to return to the Other Controller Menu.

## Understanding the Audible Alarm

When the controller becomes too hot, or detects low or high voltage, an audible alarm sounds and an event message appears in the Adaptec Disk Array Administrator window and in the event log.

Warning events are generated when the temperature or voltage enters the warning range. Shutdown events are generated when the temperature or voltage enters the shutdown range.

[Table 5-2](#) shows the temperature and voltage thresholds for each alarm and what to do to resolve the problem. Refer to the *DuraStor 6200S External RAID Controller Installation Guide* for more details.

## Changing the Alarm Mute Setting

You can enable the Mute setting on the audible alarm so that you can turn it off when it is sounding.

- 1 From the System Menu, choose **Config Menu**, then press **Enter**.

The Configuration menu appears.

- 2 Select **Alarm Mute** and press **Enter**.

The Alarm Mute menu appears. The current setting is marked with an \* next to it.

- 3 Select **Enable** and press **Enter**.

You can disable the Mute setting by repeating the steps above and selecting **Disable**.

Table 5-2. Alarm Thresholds

| Alarm Threshold                                                                             | What To Do When the Alarm Sounds                                                                                                                                                                                                                                                                                                                                      |
|---------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CPU temperature<br>Warning—0°C–5°C and 65°C–70°C<br>Shutdown—0°C, 70°C, <0°C, and >70°C     | <ul style="list-style-type: none"> <li>■ Check Adaptec Disk Array Administrator to confirm what the alarm means. See <a href="#">Chapter 3, Monitoring System Status</a>.</li> <li>■ Check the ambient temperature and lower it, if needed. Ambient temperature should be less than 45°C.</li> </ul>                                                                  |
| Onboard temperature<br>Warning—0°C–5°C and 45°C–50°C<br>Shutdown—0°C, 50°C, <0°C, and >50°C | <ul style="list-style-type: none"> <li>■ Same as above for the CPU temperature.</li> </ul>                                                                                                                                                                                                                                                                            |
| VCC voltage<br>Warning—5V -3.5% and +6.5%<br>Shutdown—5V -6.5% and +10%                     | <ul style="list-style-type: none"> <li>■ Check Adaptec Disk Array Administrator to confirm what the alarm means. See <a href="#">Chapter 3, Monitoring System Status</a>.</li> <li>■ If it is a warning alarm, let the controller continue to operate.</li> <li>■ If it is a shutdown alarm, turn off the power to the controller and send it for service.</li> </ul> |
| 12V voltage<br>Warning—12V -8% and +8%<br>Shutdown—12V -10% and +10%                        | <ul style="list-style-type: none"> <li>■ Same as above for the VCC voltage.</li> </ul>                                                                                                                                                                                                                                                                                |

## Locking the Cache

Some host OSs disable the write-back cache of the controller, resulting in degraded performance. You can prevent this by enabling the Cache Lock. (The default setting is *Disabled*.)

- 1 Press **Menu**, choose **Controller Menu**, then press **Enter**.
- 2 Choose the desired controller, then press **Enter**.
- 3 Choose **Config Menu**, then press **Enter**.
- 4 Choose **Option Config**, then press **Enter**.
- 5 Choose **Cache Lock**, then press **Enter**.
- 6 Choose the option you want, then press **Enter**.
- 7 Press **Esc** to return to the previous menu.

## Enabling and Disabling the Battery

If you do not use a battery in your controller, an alarm sounds. To eliminate the alarm, you can set the Battery option to Disabled. (The default setting is *Battery Enabled*.)




---

**Note:** You should only disable the battery if you are running the controller with an uninterruptable power supply (UPS), which ensures that you will not lose power to the controller.

---

If you set the Battery option to Disabled, the controller does not issue warning events or disable the write-back cache.

To change the battery setting:

- 1 Press **Menu**, choose **Controller Menu**, then press **Enter**.
- 2 Choose the desired controller, then press **Enter**.
- 3 Choose **Config Menu**, then press **Enter**.
- 4 Choose **Option Config**, then press **Enter**.
- 5 Choose **Battery**, then press **Enter**.
- 6 Choose the option you want, then press **Enter**.
- 7 Press **Esc** to return to the previous menu.
- 8 Reboot the controller. (See [Rebooting the Controller on page 5-2](#).)

## Changing the Utility Priority

You can change the priority at which utilities run when there are active I/O operations competing for the controller's CPU. The priority settings are

- **High** (default)—Use if your highest priority is to get the array back to a fully fault-tolerant state. At this setting, heavy I/O with the host is slower than normal.
- **Medium**
- **Low**—Use if streaming data without interruption, such as for a Web server, is more important than data redundancy. At this setting, the utilities run at a slower rate with minimal effects on host I/O.

To change the utility priority

- 1 Press **Menu**, choose **Controller Menu**, then press **Enter**.
- 2 Choose the desired controller, then press **Enter**.
- 3 Choose **Config Menu**, then press **Enter**.
- 4 Choose **Utility Priority**, then press **Enter**.
- 5 Choose the option you want, then press **Enter**.
- 6 Press **Esc** to return to the previous menu.

## Rescanning All Channels

When you install or remove disk drives, you can have the controller rescan all disk channels. Rescan temporarily pauses all I/O processes and then resumes normal operation.

If you are using a RAID appliance with an SEP, the controller performs a rescan automatically and detects removed disk drives almost immediately. Installed disk drives are detected after a 3-minute delay that gives new disk drives time to spin up.



---

**Note:** If you are installing a new disk drive, wait for it to spin up before rescanning the channels. This avoids unnecessary delays during the rescan that can cause the OS to time out.

---

To rescan all channels

- 1 Press **Menu**, choose **Controller Menu**, then press **Enter**.
- 2 Choose the desired controller, then press **Enter**.
- 3 Choose **Utilities Menu**, then press **Enter**.
- 4 Select **Rescan**, then press **Enter**.
- 5 Press **Esc** to return to the previous menu.

## Pausing I/O

The DuraStor 312R storage enclosure allows *hot-swapping* (removing and replacing disk drives while SCSI bus activity continues). The Hot Swap Pause Function suspends activity on all device channels used in the controller and protects data integrity on the connected disk drives and arrays.



**Note:** Pausing I/O halts active I/O to the host.

---



**Caution:** If you are *not* using the DuraStor Storage Subsystem, refer to your enclosure's documentation before you attempt to hot-swap disk drives.

---

To pause I/O

- 1 Press **Menu**, choose **Controller Menu**, then press **Enter**.
- 2 Choose the desired controller, then press **Enter**.
- 3 Choose **Utilities Menu**, then press **Enter**.
- 4 Choose **Hot Swap Pause**, then press **Enter**.

You can now remove and replace disk drives as required. (See the *DuraStor Installation and User's Guide* or your enclosure documentation for instructions.)



---

**Caution:** *Do not* stay in Hot Swap Pause mode for too long or an OS time-out may occur. The pause limit before time-out varies according to the OS. For example, in Windows NT, the default time limit during I/O activity is 10 seconds.

---

- 5 When you have replaced the drive, resume SCSI bus activity by pressing **Esc**.

## Restoring Default Settings

You can restore all of the controller's default settings and change those that are critical to your configuration. You may want to do this if the controller is not working properly and you cannot determine why.

- 1 Press **Menu**, choose **Controller Menu**, then press **Enter**.
- 2 Choose the desired controller, then press **Enter**.
- 3 Choose **Config Menu**, then press **Enter**.
- 4 Choose **Restore Defaults**, then press **Enter**.

The system asks you to confirm the change.

- 5 Choose **Y**, then press **Enter**.

The system confirms that the changes are made.

- 6 Press **Esc** to return to the previous menu.

# Managing Disk Drives and Enclosures

Using the OCP, you can control a variety of functions related to disk drives and enclosures.

For drives, you can

- Display drive information (see [page 6-2](#)).
- Clear metadata from a drive (see [page 6-3](#)).
- Enable/disable write-back cache (see [page 6-3](#)).
- Display disk cache status (see [page 6-4](#)).
- Enable/disable changes to SMART (see [page 6-5](#)).
- Blink a drive LED (see [page 6-5](#)).
- Take down a drive (see [page 6-6](#)).
- Test a drive (see [page 6-7](#)).

For enclosures, you can

- Change the SEP LUN (see [page 6-7](#)).
- Change additional SEP settings (see [page 6-8](#)).

## Managing Disk Drives

Using Adaptec Disk Array Administrator, you can control a variety of functions related to disk drives. You should also refer to your disk drive documentation and the *DuraStor Installation and User's Guide* for information about related functions.

## Displaying Disk Drive Information

You can display two types of information about disk drives:

- A list of all disk drives connected to the controller. See [page 6-2](#).
- The status of all disk drives in an array. See [page 2-10](#).

### Displaying All Disk Drives

You can display the following information for all disk drives connected to the controller:

- **Channel number**
- **SCSI target ID number**
- **Size**
- **Manufacturer**
- **Model number**
- **Drive firmware revision**

If any of the disk drives are members of an array, the following information may also display:

- **Utility running**—Expand, Verify, and so on.
- **Array number**—The array's sequential position in the controller's array list.
- **Member number**—The disk drive's sequential position in the array.

Disk drives that are not members of any array are listed as **Available**.

Disk drives that contain leftover metadata from a previous array are listed as **Leftover**, which happens if disk drives are pulled and reinserted. To clear leftover metadata, use the Clear Metadata Function. See [Clearing Metadata from a Disk Drive on page 6-3](#)

To display all disk drives

- 1 Press **Menu**, choose **Controller Menu**, then press **Enter**.
- 2 Choose the desired controller, then press **Enter**.
- 3 Choose **Display Drives**, then press **Enter**.
- 4 Use **↑** and **↓** to cycle through the drives.
- 5 Press **Esc** to return to the System Menu.
- 6 Press **Esc** to return to the Controller Menu.

## Clearing Metadata from a Disk Drive

All member disk drives in an array contain metadata, which is used to identify array members after a controller is changed or restarted.

If you have a disk drive that was previously a member of an array, you can clear its metadata. Disk drives with leftover metadata display **Leftover** in the Display Drives window.

Once the metadata has been cleared, you can use the disk drive again in an array or as a spare.

- 1 Press **Menu**, choose **Controller Menu**, then press **Enter**.
- 2 Choose the desired controller, then press **Enter**.
- 3 Choose **Utilities Menu**, then press **Enter**.
- 4 Choose **Drive Util Menu**, then press **Enter**.
- 5 Choose **Clear Metadata**, then press **Enter**.
- 6 Choose the disk drive you want, then press **Enter**.

The disk drive's metadata has been cleared. You can now use this drive in an array or as a spare.

## Enabling and Disabling Write-back Cache

You can control the write-back cache setting for all of your disk drives at once. The setting options are:

- **Don't Modify**—Use if you do not want the controller to change any disk drive's write-back cache settings.

- **Enable**—Use *only* if your disk drives are connected to a UPS in case of a power failure. If the disk drives are not on a UPS and power is lost, the array will lose any data in the disk's write-back cache.
- **Disable (default)**—Use if your disk drives are part of an array, since the controller is already using write-back cache to improve performance. Enabling write-back cache on the disk drive may or may not improve performance in some cases, depending on the type of array and how you are using it.

To change the write-back cache setting

- 1 Press **Menu**, choose **Controller Menu**, then press **Enter**.
- 2 Choose the desired controller, then press **Enter**.
- 3 Choose **Config Menu**, then press **Enter**.
- 4 Choose **Disk Config**, then press **Enter**.
- 5 Choose **Write-back Cache**, then press **Enter**.
- 6 Choose the option you want, then press **Enter**.
- 7 Reboot or rescan to have your changes take effect. (See [Rebooting the Controller on page 5-2](#) or [Rescanning All Channels on page 5-14](#).)

## Displaying Disk Cache Status

You can display the cache status of each disk drive.

- 1 Press **Menu**, choose **Controller Menu**, then press **Enter**.
- 2 Choose the desired controller, then press **Enter**.
- 3 Choose **Utilities Menu**, then press **Enter**.
- 4 Choose **Drive Util Menu**, then press **Enter**.
- 5 Choose **Drive Cache**, then press **Enter**.
- 6 Choose a disk drive, then press **Enter**.
- 7 Press **Esc** to return to the Drive Utilities Menu.

## Enabling and Disabling SMART Changes

You can enable or disable the ability to change the Self-Monitoring Analysis and Reporting Technology (SMART) settings for all disk drives connected to the controller. The setting options are

- **Enable**
- **Disable**
- **Don't Modify (default)**—Use if you do not want the controller to change any disk drive's SMART settings.

On most disk drives, SMART is disabled by default by the manufacturer. You may want to enable it if you want disk drives to be able to recover from errors on their own.

To enable or disable SMART changes

- 1 Press **Menu**, choose **Controller Menu**, then press **Enter**.
- 2 Choose the desired controller, then press **Enter**.
- 3 Choose **Config Menu**, then press **Enter**.
- 4 Choose **Disk Config**, then press **Enter**.
- 5 Choose **SMART**, then press **Enter**.
- 6 Choose the option you want, then press **Enter**.
- 7 Reboot or rescan to have your changes take effect. (See [Rebooting the Controller](#) on page 5-2 or [Rescanning All Channels](#) on page 5-14.)

## Blinking a Disk Drive LED

You can blink the LED of a specific disk drive.

- 1 Press **Menu**, choose **Controller Menu**, then press **Enter**.
- 2 Choose the desired controller, then press **Enter**.
- 3 Choose **Utilities Menu**, then press **Enter**.
- 4 Choose **Drive Util Menu**, then press **Enter**.
- 5 Choose **Blink Drive LED**, then press **Enter**.
- 6 Choose the disk drive you want, then press **Enter**.

The drive continues blinking its LED until you press **Esc** or repeat the Blink LED command, which toggles the Blink LED command off.

## Taking Down a Disk Drive



---

**Caution:** This function is only for testing arrays and should not be used in normal operation.

---

The Down Drive Function sets the status of a disk drive in a fault-tolerant array to Down. This forces the controller to remove it from the array and marks the array as critical. When a disk drive is down and the array is critical, you can't take down any additional disk drives in that array.

To bring the disk drive up again, you must use Rescan. See [Rescanning All Channels on page 5-14](#). After you rescan, you must clear the metadata from the disk drive before you can use it in an array or as a spare. See [Clearing Metadata from a Disk Drive on page 6-3](#).

To take down a disk drive

- 1 Press **Menu**, choose **Controller Menu**, then press **Enter**.
- 2 Choose the desired controller, then press **Enter**.
- 3 Choose **Utilities Menu**, then press **Enter**.
- 4 Choose **Drive Util Menu**, then press **Enter**.
- 5 Choose **Down Drive**, then press **Enter**.
- 6 Choose the drive you want, then press **Enter**.

The system asks you to confirm the Down Drive command.

- 7 Choose **Y**, then press **Enter**.

## Testing a Disk Drive

This Function issues a Test Unit Ready (TUR) command to the selected disk drive. A TUR tells you that the disk drive *can* respond, even if it is not otherwise functioning properly.

- 1 Press **Menu**, choose **Controller Menu**, then press **Enter**.
- 2 Choose the desired controller, then press **Enter**.
- 3 Choose **Utilities Menu**, then press **Enter**.
- 4 Choose **Drive Util Menu**, then press **Enter**.
- 5 Choose **Test Unit Ready**, then press **Enter**.
- 6 Choose the drive you want, then press **Enter**.

If the TUR was successful, TUR STATUS OK appears.

If the TUR was not successful, a failure message appears.

- 7 Press **Esc** to return to the Drive Utilities Menu.

## Managing SAF-TE Enclosures

An SEP is a SCSI device from which the RAID controller can inquire about environmental conditions such as temperature, power supply and fan status, and the presence or absence of disk drives. The RAID controller can also tell the SEP about RAID activities such as disk drive rebuilds and failed disk drives.

SAF-TE configuration settings are automatically enabled when the controller is installed in a RAID appliance that contains a SEP. No changes are required to the default configuration settings to support SAF-TE.

For SEP RAID appliances, you can

- Change the SEP LUN. See [page 6-7](#).
- Change additional SEP settings. See [page 6-8](#).

### Changing the SEP LUN

SEP LUNs allow access to SEPs. An SEP LUN may be set to a value between 0 and 63 or None. A setting of None means that the SEP cannot be accessed via a LUN.

You may want to change the SEP LUN if it conflicts with the LUN of another device.

- 1 Press **Menu**, choose **Controller Menu**, then press **Enter**.
- 2 Choose the desired controller, then press **Enter**.
- 3 Choose **Config Menu**, then press **Enter**.
- 4 Choose **SEP Configuration**, then press **Enter**.
- 5 Choose **SEP LUN**, then press **Enter**.
- 6 Choose the LUN of the SEP you want, then press **Enter**.
- 7 Choose the option or number you want to use. See [Table 6-1](#) for options.

Table 6-1. SEP LUN Options

| To                                         | Do This                                                                                                                       |
|--------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| Not assign the SEP a LUN                   | ■ Select <b>NONE</b> , then press <b>Enter</b> .                                                                              |
| Keep the same LUN for the SEP at all times | ■ Select the LUN you want to use, then press <b>Enter</b> . (This can be any number from 0 to 63 that is not already in use.) |

The system asks you to confirm the change.

- 8 Choose **Y**, then press **Enter**.

## Changing the Additional SEP Settings

You can change four additional SEP settings:

- **Polling Interval**—Controls the interval (in seconds) at which the controller polls the SEPs for status changes. The default setting is 5 seconds.
- **Temperature Sensor Status**—Controls whether the controller’s onboard temperature sensor provides temperature information to the host along with the RAID appliance’s temperature as detected by the SEP. The default setting is *OFF*, which means that neither the controller nor the appliance is providing temperature information to the host.

- **Slot Flags (Slot update status)**—Controls whether the controller sends commands to the SEP to update the status of each storage enclosure slot. The default setting is *ON*, which means that the controller requests status updates from the storage enclosure.
- **Global Flags (Enclosure update status)**—Controls whether the controller sends commands to the SEP to update the overall status of the storage enclosure. The default setting is *OFF*, which means that the controller does *not* request status updates from the storage enclosure.

To change the SEP settings

- 1 Press **Menu**, choose **Controller Menu**, then press **Enter**.
- 2 Choose the desired controller, then press **Enter**.
- 3 Choose **Config Menu**, then press **Enter**.
- 4 Choose **SEP Configuration**, then press **Enter**.
- 5 Choose **SEP Settings**, then press **Enter**.
- 6 Use ↑ and ↓ to enter the poll rate you want (in seconds), then press **Enter**.
- 7 Choose the option you want, then press **Enter**.
- 8 Choose whether you want the SEP to send slot status updates to the controller, then press **Enter**.
- 9 Choose whether you want the SEP to send enclosure status updates to the controller, then press **Enter**.

The system asks you to confirm the changes.

- 10 Choose **Y**, then press **Enter**.

# Troubleshooting

This chapter contains troubleshooting tips for a variety of problems, including information on:

- Adaptec Technical Support (see [page 7-1](#)).
- Array problems (see [page 7-1](#)).
- Host SCSI channel problems (see [page 7-3](#)).
- Device SCSI channel problems (see [page 7-3](#)).
- Boot-up problems (see [page 7-4](#)).
- Warning and error events (see [page 7-6](#)).
- Loader diagnostics and utility menus (see [page 7-8](#)).
- SCSI errors (see [page 7-9](#)).

## Adaptec Technical Support

For assistance configuring and using your Adaptec product, contact your authorized distributor or Adaptec technical support at: 1 321-207-2000 or <http://www.adaptec.com>.

Resolutions to common problems you may encounter are described in the following sections.

## Array Problems

**Problem: Array is much smaller than it should be.**

The backoff percent may be set higher than 1%, which is causing the array to be much smaller than the full size of its member disk drives.



**Note:** We strongly recommend that you leave the backoff percent at 1%.

The backoff percent setting *backs off* or reduces the capacity of the array by the given percentage. The backoff percentage helps when you assign spares by compensating for the minor capacity differences that occur between vendors. For example, two 18-GB disk drives from two different vendors may differ in capacity by 100 MB. With a backoff of 0%, you would not be able to replace an array member's slightly larger 18-GB disk drive with a smaller 18-GB disk drive. If you intend to only use identical disk drives from the same vendor, then you can use a backoff of 0%.

The default setting is 1% backoff. This default allows you to easily work with disk drives that have the same nominal capacity, but different actual capacities. The backoff percentage affects all arrays created on the controller after you set the percentage.

If the disk drives in an array are not equal in size, the array capacity in a RAID 5 array is based on the smallest member's capacity. The backoff percentage is then backed off the capacity from that amount.

To change the backoff percentage

- 1 From the System Menu, choose **Config Menu**, then press **Enter**.

The Configuration Menu appears.

- 2 Choose **Backoff Percent** and press **Enter**.

The Backoff Percent prompt appears.

- 3 Enter the backoff percent you want to use as three digits using the following format: 00.0%. The default is 01.0%.

You must enter each digit individually:

- a Press **Enter** and use ↑ and ↓ to choose the first digit.
- b Press **Enter** and use ↑ and ↓ to choose the second digit.
- c Press **Enter** and use ↑ and ↓ to choose the third digit.
- d Press **Enter**.

## Host SCSI Channel Problems

**Problem: The host SCSI BIOS scan displays “Device name not available”.**

The controller is properly connected, but no arrays have been created. Create an array and reboot the host system.

**Problem: The host SCSI BIOS scan hangs.**

Check that termination is set correctly in the Configuration Menu and the disk drive storage enclosure. Check that the device ID does not conflict with any other devices on the host SCSI channel. If you have a long SCSI cable, try a different or shorter cable.

**Problem: Only one array is displayed during host SCSI BIOS scan.**

Check to ensure that LUN support is enabled. Use Display Array Status to check the LUN assignment for each array. If LUN 0 is not assigned to an array, or some other LUN numbers are skipped, use the Change LUN Assignment option for each array until you have LUN numbers starting at 0 with no LUNs skipped. You must reboot the host system to recognize the new LUN assignment.

**Problem: All arrays are displayed during host SCSI BIOS scan, but only one array is seen by the OS.**

SCSI drivers for some OSs require a parameter switch to enable LUN support. For example, the NetWare driver, `aic7870.dsk`, requires the driver parameter `LUN_ENABLE=FF` (in `startup.ncf`) to scan for all LUNs. Check the driver documentation for your host SCSI channel. You may also need to compact the LUN mapping.

## Device SCSI Channel Problems

**Problem: Not all disk drives connected to the controller device channels are displayed during boot, or the controller hangs during display of connected disk drives and never reaches the LCD window.**

Check your storage enclosure documentation to be sure that the enclosure is properly configured for use with a RAID controller. (The DuraStor 312R is configured properly.) If your storage enclosure supports removable disk drives, check the disk drive

shuttles to be sure that the power, SCSI, and ID connectors are properly seated. Check termination and ID assignment. If you have enabled Ultra/Ultra2 SCSI on any device channels, try disabling it.




---

**Note:** Check the controller termination settings for all channels.

---

## Problems During Bootup

The following sections describe problems you might encounter during POST or during bootup, and explain how to resolve those problems. POST shows problems related to the processor, logic, and memory.

### **Problem: The controller hangs during bootup.**

Ensure that all cables are connected properly for your operating mode. (Refer to the *DuraStor Installation and User's Guide* for details.)

Ensure that your system is properly terminated. External terminators are required for any dual controller configuration where Host 2 In (CH 0), Host 1 In (CH 3), Disk CH 1, or Disk CH 2 are not cabled. (External terminators are not required for any stand-alone configuration.)

### **Problem: The controller failed the onboard memory test.**

When this failure occurs, it means the internal CPU memory failed. Replace the controller to correct the problem.

### **Problem: One of the POST diagnostic tests failed.**

Contact Adaptec technical support.

### **Problem: The system hangs at CT\_srv starting.**

Follow these steps to resolve the problem:

- 1 Check the disk and host channels to make sure they are properly terminated.
- 2 Verify that there are no SCSI address conflicts.

- 3 Check the storage enclosure to make sure everything is properly connected.
- 4 If the storage enclosure and the disk drive work properly, replace the controller.

**Problem: The system hangs during a disk drive scan.**

Follow these steps to resolve the problem:

- 1 Check the storage enclosure to make sure everything is properly connected.
- 2 Remove and replace the disk drive that failed the scan.
- 3 If the storage enclosure and the disk drive work properly, replace the controller.

**Problem: An active-active controller pair hangs during bootup disk drive scan.**

Verify that all SCSI channels are connected, cabled, and terminated properly. Verify that the controllers are set to their default configuration (active-active dual-port mode).

**Problem: An active-active controller pair hangs the host system during normal operation or after failing over.**

Verify that all SCSI channels are connected, cabled, and terminated properly.

**Problem: An active-active controller pair always fails over after booting up.**

Verify that the controller that is failed/killed is set to its default configuration (active-active dual-port mode). Verify the same SDRAM sizes are in both controllers. Active-active controllers require the same SDRAM size.

**Problem: One controller of an active-active controller pair displays the following message when booting: "Other Controller is attempting to reset this controller".**

This message appears on failback if the failed controller has not been replaced. The message continues to display whenever you

boot the working controller and change its configuration. To eliminate the message, replace the failed controller.

## Warning and Error Events

There are a number of conditions that trigger warning or error events, activate the audible alarm, and may affect the state of the Status and Fault LEDs. The audible alarm sounds mainly when Adaptec Disk Array Administrator displays a warning or error event.

[Table 7-1](#) and [Table 7-2](#) provide a list of warning and error events and recommended actions to take to fix the problems.

### Warnings

Warning events let you know that something related to the controller or an array has a problem. You should correct the problem as soon as possible. [Table 7-1](#) defines each warning event and recommends the action you should take.

Table 7-1. Warning Events

| Event             | Definition                                                                                                                                  | Recommended Action                                                                                                                                                                                       |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ARRAY<br>CRITICAL | One or more disk drives were downed and the array is online, but is no longer fault tolerant.                                               | Add a spare to the array or the spare pool. Then replace the bad disk drives. See <a href="#">Adding a Dedicated Spare on page 4-2</a> or <a href="#">Adding a Spare to the Spare Pool on page 4-5</a> . |
| ARRAY<br>OFFLINE  | One disk drive in a RAID 0 or volume set went down, bringing the array to an offline state. This array is no longer accessible by the host. | Replace the bad disk drive and restore the data from backup.                                                                                                                                             |
| BATT FAIL<br>INFO | A warning condition in the battery pack and/or charging interface has been detected.                                                        | Replace the battery. Refer to the <i>DuraStor Installation and User's Guide</i> .                                                                                                                        |

Table 7-1. Warning Events (*Continued*)

| Event            | Definition                                                                                                                                                                    | Recommended Action                                                                                                                                                                                      |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DRIVE DOWN       | An error occurred with the disk drive and it was downed, removing it from the active array.                                                                                   | Add a spare to the array or the spare pool. Then replace the bad disk drive. See <a href="#">Adding a Dedicated Spare on page 4-2</a> or <a href="#">Adding a Spare to the Spare Pool on page 4-5</a> . |
| REPLACE BATTERY  | The battery is approaching its 3-year life span.                                                                                                                              | Replace the battery.                                                                                                                                                                                    |
| SDRAM CORR ECC   | A correctable single-bit SDRAM ECC error occurred.                                                                                                                            | If this error occurs frequently, replace the memory. Refer to the <i>DuraStor Installation and User's Guide</i> .                                                                                       |
| SMART EVENT      | A disk drive informational exceptions page control (IEPC) predictive failure message was received. No actions by the controller are taken on the disk drive for these events. | Run diagnostics available from your OS on the affected disk drive. Replace the drive, if necessary.                                                                                                     |
| SPARE UNUSABLE   | The disk drive still contains metadata that must be cleared.                                                                                                                  | Clear the metadata from the spare drive. See <a href="#">Clearing Metadata from a Disk Drive on page 6-2</a> .                                                                                          |
| UNWRITABLE CACHE | The SDRAM cache has battery backed-up data, and the arrays assigned to this data are not present.                                                                             | Either determine which disk drives are missing and reinstall them, or select <b>Yes</b> when asked if you want to discard this data.                                                                    |
| VOLT/TEMP WARN   | The analog-to-digital convertor monitored a temperature and/or voltage in the warning range.                                                                                  | Check that the controller's fan is running. Check that the ambient temperature is not too warm. Refer to the <i>DuraStor Installation and User's Guide</i> .                                            |

## Errors

Error events let you know that something related to the storage enclosure, controller, or disk drives has failed and requires immediate attention. [Table 7-2](#) defines each error event and recommends the action you should take.

Table 7-2. Error Events

| Event            | Definition                                                                                   | Recommended Action                                                                                                                                           |
|------------------|----------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| BATTERY FAILED   | A failure in the battery pack and/or charging interface has been detected.                   | Replace the controller's battery. Refer to the <i>DuraStor Installation and User's Guide</i> .                                                               |
| DISK CHAN FAILED | An error has occurred in communicating on the disk channel.                                  | Check the cables on the channel. Check the termination on the disk channel. Refer to the <i>DuraStor Installation and User's Guide</i> .                     |
| ENCLOSURE FAIL   | Enclosure-specific general purpose I/O triggered a failure condition.                        | Check the status of the storage enclosure. Refer to the <i>DuraStor Installation and User's Guide</i> .                                                      |
| SDRAM UNCORR ECC | A noncorrectable multiple-bit SDRAM ECC error occurred.                                      | Reseat the memory. If the problem continues, replace the memory. Refer to the <i>DuraStor Installation and User's Guide</i> .                                |
| VOLT/TEMP FAIL   | The analog-to-digital convertor monitored a temperature and/or voltage in the failure range. | Check that the controller's fan is running. Check that the ambient temperature is not too warm. Refer to the <i>DuraStor Installation and User's Guide</i> . |

## Using the Loader Diagnostics Menu

If you have any diagnostic errors, contact Adaptec technical support. (See [page 7-1](#) for contact information.)

## Using the Loader Utility Menu

If you have any diagnostic errors, contact Adaptec technical support. (See [page 7-1](#) for contact information.)

# Understanding SCSI Errors

The event log includes SCSI errors reported by SEPs and disk drives on your system. If you see these errors in the event log, the information below may assist you. For more information about viewing the event log, see [Using the Event Log on page 3-1](#).

## Disk Errors

If a disk drive detects an error, it reports the error, which is recorded in the event log. [Figure 7-1](#) shows an example of a disk drive-detected error.

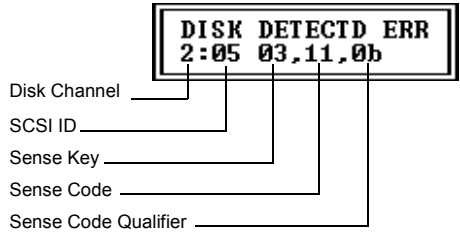


Figure 7-1. Disk-Detected Error Example

Using the information in [Table 7-3](#) and [Table 7-4](#), you can see that the example in [Figure 7-1](#) is a medium error, unrecovered read error—recommend reassignment.

[Table 7-3](#) lists some of the most common SCSI sense key descriptions (in hexadecimal). [Table 7-4](#) lists the descriptions for the most common sense codes (ASC) and sense code qualifiers (ASCQ), all in hexadecimal. Refer to the *SCSI Primary Commands - 2 (SPC-2) Specification* for a complete list of ASC and ASCQ descriptions.

Table 7-3. Sense Key Descriptions

| Sense Key | Description     |
|-----------|-----------------|
| 0h        | No sense        |
| 1h        | Recovered error |
| 2h        | Not ready       |
| 3h        | Medium error    |
| 4h        | Hardware error  |
| 5h        | Illegal request |
| 6h        | Unit attention  |
| 7h        | Data protect    |
| 8h        | Blank check     |
| 9h        | Vendor-specific |
| Ah        | Copy aborted    |
| Bh        | Aborted command |
| Ch        | Obsolete        |
| Dh        | Volume overflow |
| Eh        | Miscompare      |
| Fh        | Reserved        |

Table 7-4. ASC and ASCQ Descriptions

| ASC | ASCQ | Descriptions                                         |
|-----|------|------------------------------------------------------|
| 0C  | 02   | Write error—auto-reallocation failed                 |
| 0C  | 03   | Write error—recommend reassignment                   |
| 11  | 00   | Unrecovered read error                               |
| 11  | 01   | Read retries exhausted                               |
| 11  | 02   | Error too long to correct                            |
| 11  | 03   | Multiple read errors                                 |
| 11  | 04   | Unrecovered read error—<br>auto-reallocation failed  |
| 11  | 0B   | Unrecovered read error—recommend<br>reassignment     |
| 11  | 0C   | Unrecovered read error—recommend<br>rewrite the data |
| 47  | 00   | SCSI parity error                                    |
| 48  | 00   | Initiator-detected error message<br>received         |

## Disk Channel Errors

Disk channel errors are similar to disk-detected errors, except they are detected by the controller, instead of the disk drive. Some disk channel errors are displayed as text strings, others are displayed as hexadecimal codes.

Figure 7-2 shows a disk channel error displaying the hexadecimal code. Table 7-5 lists the error code descriptions. Most disk channel errors are informational because the controller issues retries to correct any problem. Errors that cannot be corrected with retries will result in another critical event describing the affected disk array (if any).



Figure 7-2. Disk Channel Error Example

Table 7-5. Disk Channel Error Codes

| Error Code | Description                                                                                       |
|------------|---------------------------------------------------------------------------------------------------|
| 04         | Data overrun or underrun occurred while getting sense data.                                       |
| 05         | Request for sense data failed.                                                                    |
| 20         | Selection timeout occurred (displayed as Sel Timeout).                                            |
| 21         | Controller detected an unrecoverable protocol error on the part of the target.                    |
| 22         | Unexpected bus-free condition occurred (displayed as Unex Bsfree).                                |
| 23         | Parity error on data was received from a target (displayed as Parity Err).                        |
| 24         | Data overrun or underrun has been detected (displayed as Data OvUnRn).                            |
| 30         | Target reported Busy status (displayed as Device Busy).                                           |
| 31         | Target reported Queue Full status (displayed as Queue Full).                                      |
| 32         | Target has been reserved by another initiator.                                                    |
| 40         | Controller aborted an I/O request to this target because it timed out (displayed as I/O Timeout). |

Table 7-5. Disk Channel Error Codes (*Continued*)

| Error Code | Description                                                                                                     |
|------------|-----------------------------------------------------------------------------------------------------------------|
| 41         | I/O request was aborted because of a channel reset.                                                             |
| 42         | I/O request was aborted because of controller's decision to reset the channel.                                  |
| 43         | I/O request was aborted because of third-party channel reset (displayed as Abort 3PRST).                        |
| 44         | Controller decided to abort I/O request for reasons other than bus or target reset.                             |
| 45         | I/O request was aborted because of target reset requested by controller.                                        |
| 46         | Target did not respond properly to abort sequence.                                                              |
| 4B         | I/O aborted due to operating mode change (such as LVD to SE or SE to LVD) (displayed as Abort MdChg).           |
| 50         | Disk channel hardware failure (displayed as DskChn Fail). This may be the result of bad termination or cabling. |

## Voltage and Temperature Errors and Warnings

Most voltage and temperature errors and warnings occur due to the storage enclosure. Check the storage enclosure configuration first.

## A

- active-active mode
  - array ownership 2-18
  - definition 5-6
  - host channel 0 5-7
  - pool spares 4-1, 4-4
- activity screen 3-2
- Adaptec 7-1
- alarm. *See* audible alarm
- array number 6-2
- arrays 2-1 to 2-20
  - adding disk drives 2-16
  - backoff percentage 7-2
  - chunk size 2-5
  - creating 2-1 to 2-20
  - critical arrays 2-15
  - deleting 2-20
  - disk drive requirements 2-1
  - expanding 2-15 to 2-17
  - initializing 2-5
  - managing 2-9
  - multiple-partition 2-6 to 2-8
  - naming 2-3, 2-17
  - ownership 2-18
  - partitions
    - adding 2-9
    - multiple 2-2
    - single 2-2
  - RAID 10 2-3
  - reconstructing 2-15, 4-1
  - reusing drives 4-2
  - serial numbers 2-10
  - single-partition 2-2 to 2-5
  - spare pools 4-4
  - status 2-10
  - status, expansion 2-17
  - stopping initialization 2-12

- troubleshooting 7-1
- trusting 2-18 to 2-20
- utilities 2-11
- verifying 2-13 to 2-14

audible alarm 5-11

## B

- backoff percentage 7-2
- battery 5-13
- blinking LEDs 6-5
- bootup troubleshooting 7-4
- bus speed 5-5

## C

- cache lock 5-13
- channel 3, enabling/disabling 5-7
- channel number 2-12
- channels
  - configuring 5-5
  - errors 7-11
  - rescanning 5-14
- chunk size 2-5
- controllers
  - alarm mute setting 5-11
  - battery 5-13
  - cache lock 5-13
  - configuring 5-1 to 5-16
  - dates 5-2
  - defaults 5-16
  - host channels 5-3
  - killing other 5-10
  - operating modes 5-6 to 5-8
  - other controller 5-8 to 5-11
  - pausing I/O 5-15
  - rebooting 5-2
  - rescan rate 4-4
  - rescanning disk drives 5-14

- restoring defaults 5-16
- SAF-TE enclosures 6-7
- SCSI channels 5-5
- SEP 6-7
- shutting down 5-9
- time 5-3
- unkilling other 5-10
- utility priority 5-14

## D

- dedicated spares 2-4, 4-1 to 4-3
  - adding 4-2
  - definition 4-1
  - deleting 4-3
- defaults 5-16
- deleting
  - arrays 2-20
  - dedicated spares 4-3
  - partitions 2-20, 2-25
- device SCSI channel 7-3
- disk channel errors 7-11
- disk drive requirements 2-1
- disk drives 6-1 to 6-7
  - adding 2-16
  - array number 6-2
  - cache status 6-4
  - channel number 2-12
  - channel rescanning 5-14
  - displaying 6-2
  - Drive Down Function 6-6
  - drive numbers 2-12
  - errors 7-9
  - hot-swapping 5-15
  - LEDs 6-5
  - member number 6-2
  - metadata 6-3
  - rescanning 6-6
  - rescanning channels 5-14
  - size 2-12
  - SMART 6-5
  - spare pools 4-4

- spare types 4-1
- status 2-12
- target ID 2-12
- testing 6-7
  - TUR command 6-7
- domain validation 5-6
- Down Drive Function 6-6
- drive numbers 2-12
- drives. *See* disk drives
- dynamic spares
  - definition 4-3
  - rescan rate 4-4

## E

- enclosures 6-7 to 6-9
- error events 7-8
- event log 3-1

## F

- fans screen 3-3
- firmware 5-7

## G

- global flags 6-9

## H

- hardware 3-4
- hardware menu 3-2 to 3-4
  - activity screen 3-2
  - fans screen 3-3
  - mode screen 3-4
  - power screen 3-3
- help 7-1
- histogram 3-5
- host channel 0 5-7
- host channels 5-3 to 5-5
- host SCSI channel 7-3
- Hot Swap Pause Function 5-15
- hot-swapping 5-15

**I**

I/O connectivity panel 1-1  
 I/O, pausing 5-15  
 I/O, size statistics 2-22  
 initializing arrays 2-5  
     stopping initialization 2-12  
 Input/Output. *See* I/O

**K**

Kill Other Function 5-10  
 killing other controller 5-10

**L**

LEDs 6-5  
 Logical Unit Numbers. *See* LUNs  
 LUNs  
     array ownership 2-18  
     host LUNs 2-26  
     multiple 2-2  
     partitions 2-25  
     SEP 6-7  
     statistics 3-4

**M**

member number 6-2  
 menu trees 1-3 to 1-5  
 metadata 6-3  
 mode screen 3-4  
 monitoring 3-1 to 3-6  
     event log 3-1  
     hardware menu 3-2 to 3-4  
     utilities menu 3-4 to 3-6  
 multiple LUNs 2-2  
 multiple-partition arrays 2-6 to 2-8  
     definition 2-2  
 mute setting 5-11

**N**

naming arrays 2-17

naming partitions 2-24

**O**

OCP 1-1  
 operating modes 5-6 to 5-8  
 Operator Control Panel. *See* OCP  
 other controller 5-8 to 5-11  
     killing 5-10  
     shutting down 5-9  
     unkilling 5-10

**P**

Partition Menu 2-22  
 partitions 2-15, 2-21 to 2-26  
     adding 2-9  
     array state 2-21  
     creating 2-15  
     deleting 2-20, 2-25  
     expanding 2-24  
     LUNs 2-25  
     managing 2-21  
     naming 2-24  
     resizing 2-15  
     size 2-21  
     statistics 2-22 to 2-24, 3-4  
     target ID and LUN 2-21  
     viewing status 2-21 to 2-24  
 polling interval 6-8  
 pool spares. *See* spares  
 POST 7-4  
 Power On Self-Test. *See* POST  
 power screen 3-3

**Q**

queue depth 2-22 to 2-23

**R**

RAID 10 arrays 2-3  
 RAID levels  
     disk drive additions 2-16

- disk drive requirements 2-1
- Read statistic 2-22
- read/write statistics 3-5
- rebooting controllers 5-2
- reconstructing arrays 4-1
- redundant arrays
  - reconstructing 2-15, 4-1
  - spare pools 4-4
- Rescan Function 6-6
- rescan rate 4-4
- rescanning channels 5-14
- resizing partitions 2-15

## S

- SAF-TE enclosures 6-7 to 6-9
- SAF-TE Environmental Processor.
  - See* SEPs
- SCSI
  - BIOS 7-3
  - channels
    - configuring 5-5
    - troubleshooting 7-3 to 7-4
  - domain validation 5-6
- SCSI channel 3 5-7
- SCSI ID 5-5
- SecRd statistic 2-22
- SecWt statistic 2-22
- Select Drives menu 2-4
- Self-Monitoring, Analysis and Reporting Technology. *See* SMART
- self-test. *See* POST
- sense keys 7-10
- SEP settings 6-8
- SEPs 6-7 to 6-9
  - channels, rescanning 5-14
  - LUNs, changing 6-7
- serial numbers 2-10
- shutdown events 5-11
- single-partition arrays 2-2 to 2-5
- slot flags 6-9
- SMART 6-5

- spare drives. *See* spares
- spare pool 4-4
- spares 4-1 to 4-5
  - active-active mode 4-1, 4-4
  - adding 4-2
  - capacity limitations of 4-2
  - dedicated 2-4, 4-1 to 4-3
  - definitions
    - dedicated spares 4-1
    - dynamic spares 4-3
  - deleting 4-3
  - dynamic 4-3
  - pool spares 4-1, 4-4
  - rescan rate 4-4
  - reusing drives 4-2
  - types 4-1
- stand-alone mode
  - dual-port mode 5-7
  - SCSI channel 3 5-7
  - single-port mode 5-7
- statistics 2-22 to 2-24, 3-4 to 3-6
  - general 3-4
  - histogram 3-5
  - partitions 2-22 to 2-24
  - reads/writes 3-5
  - resetting 2-23, 3-6
- status
  - array expansion 2-17
  - arrays 2-10
  - disk drives 2-12
  - partitions 2-21

## T

- target ID 2-12, 2-21
- technical support 7-1
- temperature sensor 6-8
- temperature warnings 7-12
- Test Unit Ready command. *See* TUR command
- timing out 1-2
- troubleshooting 7-1
  - bootup 7-4

- device SCSI channel 7-3
- host SCSI channel 7-3
- Trust Array Function 2-18
- trusting arrays 2-18 to 2-20
- TUR command 6-7

## **U**

- unkilling other controller 5-10
- utilities 2-11
- utilities menu 3-4 to 3-6
  - hardware information 3-4
- utility priority 5-14

## **V**

- verifying arrays 2-13 to 2-14
- voltage warnings 7-12

## **W**

- warning events 5-11, 7-6
- Write statistic 2-22
- write-back cache
  - enabling/disabling 6-3
  - locking 5-13
  - status 6-4
  - UPS 6-4
- write-back caching status 2-22



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